Vol. 983 Number 3

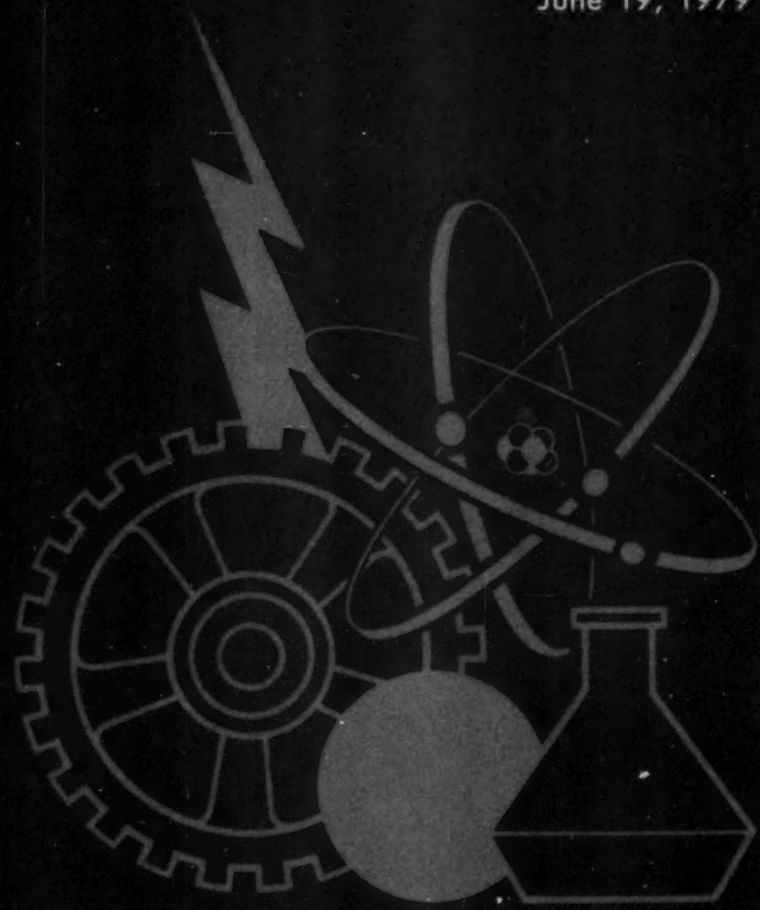
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

June 19, 1979



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

June 19, 1979 Volume 983 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) : Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER,
Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,630,066, Re. S.N. 032,068, Filed Apr. 23, 1979, Cl. 72/305, APPARATUS FOR RETURNING VEHICLE BODY AND FRAME COMPONENTS TO THEIR ORIGINAL LOCATIONS DURING REPAIR AND SERVICING OF VEHICLES, Finis L. Chisum, Owner of Record: *Inventor,* Attorney or Agent: James R. Head, et al., Ex. Gp.: 321

3,664,402, Re. S.N. 033,551, Filed Apr. 27, 1979, Cl. 152/209, TREAD FOR HEAVY-DUTY RADIAL-CARCASS TIRE, Jean Bernard Montagne, Owner of Record: *Compagnie Generale des Establissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand, Puy-de-Dome, France,* Attorney or Agent: Granville M. Brumbaugh, et al., Ex. Gp.: 316

3,747,979, Re. S.N. 031,316, Filed Apr. 18, 1979, Cl. 297/451, CANTILEVERED SEAT FOR MOTORCOACH VEHICLES OR THE LIKE, Chester J. Barecki (deceased), by American Seating Company, Owner of Record: *American Seating Company, Grand Rapids, Mich.,* Attorney or Agent: Peter P. Price, et al., Ex. Gp.: 355

3,918,245, Re. S.N. 033,018, Filed Apr. 24, 1979, Cl. 57/58.54, SIMULTANEOUS MULTIPLE TWISTING APPARATUS, Sakujiro Matsumura, et al., Owner of Record: *Toyo Tire Cord Company Limited, Osaka, Japan,* Attorney or Agent: Austin R. Miller, et al., Ex. Gp.: 244

3,992,858, Re. S.N. 030,318, Filed Apr. 16, 1979, Cl. 56/7, HYDRAULIC SYSTEM FOR CONTROLLING A GANG OF LAWN MOWERS, Glenn Richard Hubbard, et al., Owner of Record: *Jacobsen Manufacturing Company, Racine, Wis.,* Attorney or Agent: Arthur J. Hansmann, Ex. Gp.: 333

4,016,643, Re. S.N. 028,423, Filed Apr. 9, 1979, Cl. 29/571, OVERLAY METALLIZATION FIELD EFFECT TRANSISTOR, Robert A. Pucel, et al., Owner of Record: *Inventors,* Attorney or Agent: Joseph D. Pannone, et al., Ex. Gp.: 254

4,018,826, Re. S.N. 030,781, Filed Apr. 17, 1979, Cl. 260/583 P, PROCESS FOR PREPARING POLYVINYLAMINE AND SALTS THEREOF, Richard D. Gless, Jr., et al., Owner of Record: *Dynapol Corporation, Palo Alto, Calif.,* Attorney or Agent: William H. Benz, Ex. Gp.: 117

4,018,929, Re. S.N. 031,101, Filed Apr. 18, 1979, Cl. 424/263, 3-LOWERALKYLCARBAMYLSULFONAMIDO-4-PHENYLAMINOPYRIDINE-N-OXIDE, DERIVATIVES THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME, Jacques E. Delarge, et al., Owner of Record: *A. Christiaens Societe Anonyme, Brussells, Belgium,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 125

4,024,428, Re. S.N. 031,211, Filed Apr. 18, 1979, Cl. 315/151, RADIATION-SENSITIVE CONTROL CIRCUIT FOR DRIVING LAMP AT VARIOUS POWER LEVELS, Gerald Bachur, et al., Owner of Record: *Optical Associates, Inc., Santa Clara, Calif.,* Attorney or Agent: Harvey J. Lowhurst, Ex. Gp.: 256

4,038,459, Re. S.N. 029,459, Filed Apr. 12, 1979, Cl. 429/198, HALOGEN COMPLEXING ALCOHOLS AND NITRILES, Alfred M. Ajami, et al., Owner of Record: *Eco-Control, Inc., Cambridge, Mass.,* Attorney or Agent: Melvin R. Jenney, et al., Ex. Gp.: 114

4,040,507, Re. S.N. 031,091, Filed Apr. 18, 1979, Cl. 188/112, AUTOMATIC TRAILER SWAY SENSING AND BRAKE APPLYING SYSTEM, Herman A. Reise, Owner of Record: *Durrell U. Howard, San Antonio, Tex.,* Attorney or Agent: Elliott I. Pollock, Ex. Gp.: 315

4,041,813, Re. S.N. 012,034, Filed Feb. 14, 1979, Cl. 83/14, METHOD AND APPARATUS FOR TRANSVERSE CUTTING, Harvey J. Spencer, Owner of Record: *Paper Converting Machine Company, Green Bay, Wis.,* Attorney or Agent: Timothy L. Tilton, et al., Ex. Gp.: 323

4,054,597, Re. S.N. 032,582, Filed Apr. 23, 1979, Cl. 260/463, THIODIGLYCOL POLYCARBONATES, Heinrich Krimm, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Gene Harsh, et al., Ex. Gp.: 122

4,084,317, Re. S.N. 027,663, Filed Apr. 6, 1979, Cl. 30/94, SHEARING TOOL FOR SYNTHETIC RESIN TUBES, Masahiko Nakamura, et al., Owner of Record: *Inventors,* Attorney or Agent: William Douglas Sellers, et al., Ex. Gp.: 323

4,084,396, Re. S.N. 032,233, Filed Apr. 23, 1979, Cl. 56/98, ADJUSTABLE ROW SPACING FORAGE HEAD, David P. Fritz, et al., Owner of Record: *Hesston Corporation, Hesston, Kans.,* Attorney or Agent: Gordon D. Schmidt, et al., Ex. Gp.: 333

4,092,199, Re. S.N. 967,213, Filed Dec. 7, 1978, Cl. 156/222, HIGH PRESSURE DECORATIVE LAMINATE HAVING REGISTERED COLOR AND EMBOSSING, Israel S. Ungar, et al., Owner of Record: *Nevamar Corporation, Odenton, Md.,* Attorney or Agent: Karl W. Flocks, Ex. Gp.: 161

4,099,837, Re. S.N. 032,129, Filed Apr. 23, 1979, Cl. 350/96.29, COATING OF FIBER LIGHTGUIDES WITH UV CURED POLYMERIZATION PRODUCTS, Hargovind Nihchaldas Vazirani, Owner of Record: *Bell Telephone Laboratories Incorporated, Murray Hill, N.J.,* Attorney or Agent: W. L. Keefauver, et al., Ex. Gp.: 257

4,103,060, Re. S.N. 029,702, Filed Apr. 11, 1979, Cl. 428/241, AREA-RETROREFLECTORIZATION OF FABRICS, Wallace Karl Bingham, et al., Owner of Record: *Minnesota Mining and Manufacturing Company, St. Paul, Minn.,* Attorney or Agent: Cruzan Alexander, Ex. Gp.: 164

4,105,072, Re. S.N. 032,511, Filed Apr. 23, 1979, Cl. 166/261, PROCESS FOR RECOVERING CARBONACEOUS VALUES FROM POST IN SITU OIL SHALE RETORTING, Chang Yul Cha, Owner of Record: *Occidental Oil Shale, Inc., Grand Junction, Colo.,* Attorney or Agent: Richard D. Seibel, Ex. Gp.: 354

4,105,474, Re. S.N. 029,868, Filed Apr. 13, 1979, Cl. 148/12 F, PROCESS FOR PRODUCING A HIGH TENSION STEEL SHEET PRODUCT HAVING AN EXCELLENT LOW-TEMPERATURE TOUGHNESS WITH A YIELD POINT OF 40 KG/MM 2 OR HIGHER, Hajime Nakasugi, et al., Owner of Record: *Nippon Steel Corporation, Tokyo, Japan,* Attorney or Agent: John E. Lind, et al., Ex. Gp.: 111

4,108,369, Re. S.N. 029,927, Filed Apr. 13, 1979, Cl. 236/1 G, AUTOMATIC FLUE DAMPER, John Prikkel, III, Owner of Record: *Inventor,* Attorney or Agent: H. Talman Dybvig, et al., Ex. Gp.: 344

4,108,852, Re. S.N. 031,589, Filed Apr. 19, 1979, Cl. 260/239.3 B, PROCESS FOR PREPARING 1,5-BENZODIAZEPINE-2-ONES, Oskar Bub, Owner of Record: *Knoll A.G., Ludwigshafen am Rhein, Germany,* Attorney or Agent: Donald R. Bentz, Ex. Gp.: 121

4,110,084, Re. S.N. 030,275, Filed Apr. 16, 1979, Cl. 51/307, COMPOSITE OF BONDED CUBIC BORON NITRIDE CRYSTALS ON A SILICON CARBIDE SUBSTRATE, Minyoung Lee, et al, Owner of Record: *General Electric Company, Schenectady, N.Y.,* Attorney or Agent: Jane M. Binkowski, et al., Ex. Gp.: 323

4,110,122, Re. S.N. 026,754, Filed Apr. 3, 1979, Cl. 136/89 P, HIGH-INTENSITY, SOLID-STATE SOLAR-CELL DEVICE, Roy Kaplow, et al., Owner of Record: *Massachusetts Institute of Technology, Cambridge, Mass.,* Attorney or Agent: Roy C. Hopgood, et al., Ex. Gp.: 114

PATENT NOTICES

Certificates of Correction for the Week of June 19, 1979

P.P. 4,193	4,107,256	4,123,377	4,138,555
Re. 29,698	4,107,556	4,123,428	4,138,583
Re. 29,746	4,107,645	4,124,186	4,138,617
Re. 29,920	4,107,885	4,124,550	4,138,647
D. 250,924	4,108,294	4,124,667	4,138,723
3,726,919	4,108,369	4,125,078	4,139,525
3,982,261	4,108,518	4,126,908	4,139,672
4,009,257	4,108,817	4,127,230	4,139,973
4,012,353	4,109,283	4,128,562	4,139,992
4,013,100	4,109,343	4,129,453	4,140,338
4,015,052	4,110,732	4,129,597	4,140,476
4,015,233	4,110,794	4,129,665	4,140,585
4,016,841	4,111,367	4,130,535	4,140,586
4,029,655	4,111,672	4,131,679	4,141,001
4,034,146	4,112,076	4,131,882	4,141,390
4,038,018	4,112,207	4,132,364	4,141,562
4,048,411	4,112,632	4,132,439	4,141,714
4,049,342	4,112,764	4,132,695	4,141,750
4,065,731	4,113,087	4,132,729	4,141,863
4,077,842	4,113,443	4,133,562	4,142,517
4,084,438	4,113,765	4,133,650	4,142,883
4,086,549	4,113,935	4,133,859	4,143,214
4,094,315	4,114,681	4,133,886	4,143,570
4,095,167	4,115,494	4,133,927	4,143,626
4,096,574	4,115,532	4,133,980	4,143,967
4,097,464	4,116,541	4,134,798	4,144,159
4,098,726	4,116,711	4,135,787	4,144,180
4,099,546	4,116,851	4,136,368	4,144,492
4,102,396	4,116,995	4,136,727	4,144,543
4,103,998	4,117,009	4,137,108	4,144,686
4,104,026	4,118,433	4,137,202	4,144,784
4,105,400	4,120,063	4,137,225	4,145,030
4,105,401	4,120,375	4,137,237	4,145,080
4,105,451	4,120,989	4,137,338	4,145,115
4,105,575	4,121,911	4,137,586	4,145,716
4,106,950	4,121,932	4,138,423	4,146,638
4,107,046	4,122,309	4,138,525	
4,107,059	4,122,525	4,138,544	
4,107,104	4,127,732	4,138,552	

Disclaimers

Design No. 230,786.—*Chester J. Barecki*, Grand Rapids, Mich. TRANSIT SEAT. Patent dated Mar. 19, 1974. Disclaimer filed Apr. 19, 1979, by the assignee, *American Seating Company*.

Hereby enters this disclaimer to the claim in said patent.

Design No. 233,918.—*Chester J. Barecki*, Grand Rapids, Mich. TRANSIT SEAT. Patent dated Dec. 17, 1974. Disclaimer filed Apr. 19, 1979, by the assignee, *American Seating Company*.

Hereby enters this disclaimer to the claim in said patent.

3,114,349.—*Seymour Schuman*, New York, N.Y. STERILIZATION INDICATORS. Patent dated Dec. 17, 1963. Disclaimer filed Mar. 27, 1978, by the assignee, *Propper Manufacturing Co., Inc.*

Hereby enters this disclaimer to claim 4 of said patent.

3,618,446.—*Hugh Black*, Downers Grove, Ill. WOOD FASTENERS. Patent dated Nov. 9, 1971. Disclaimer filed Apr. 9, 1979, by the assignee, *Woodloc Incorporated*.

The term of this patent subsequent to Mar. 11, 1986, has been disclaimed.

3,692,926.—*Donald J. Smith*, Canoga Park, Calif. ALIGNABLE END SEALS FOR A SPLICE CASE. Patent dated Sept. 19, 1972. Disclaimer filed Jan. 25, 1979, by the assignee, *Smith-Schreyer and Assoc., Inc.*

Hereby enters this disclaimer to all claims of said patent.

3,712,033.—*Donald D. Gronholz*, Minneapolis, Minn. AIR CLEANER WITH HINGED SIDE WALLS. Patent dated Jan. 23, 1973. Disclaimer filed Apr. 16, 1979, by the assignee, *Donaldson Company, Inc.*

Hereby enters this disclaimer to claims 1, 2, 10, and 11 of said patent.

3,778,985.—*Paul A. Daigle*, Castle Rock and *Donald D. Gronholz*, Bloomington, Minn. AIR CLEANER WITH FOLDING SIDE WALLS. Patent dated Dec. 18, 1973. Disclaimer filed Apr. 16, 1979, by the assignee, *Donaldson Company, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3,785,163.—*William Wagner*, Miami Beach, Fla. REFRIGERANT CHARGING MEANS AND METHOD. Patent dated Jan. 15, 1974. Disclaimer filed Feb. 11, 1979, by the assignee, *Watsco Inc.*

Hereby enters this disclaimer to all claims of said patent.

3,944,606.—*Manfred Rieger*, Ludwigshafen and *Johannes Kioustelidis*, Mannheim, Germany. PROCESS OF PRODUCING ALKALI METAL OR AMMONIUM CITRATES. Patent dated Mar. 16, 1976. Disclaimer filed Mar. 27, 1979, by the assignee, *Joh. A. Benckiser GmbH*.

Hereby enters this disclaimer to claims 1, 2, 3, 5, 7, 10, 11, 12, and 13 of said patent.

4,001,005.—*Robert J. Theissen*, Westfield, N.J. HERBICIDAL COMPOSITIONS COMPRISING HALOPHENOXY BENZOIC ACID ESTERS. Patent dated Jan. 4, 1977. Disclaimer filed Feb. 9, 1979, by the assignee, *Mobil Oil Corporation*.

The term of this patent subsequent to Mar. 28, 1989, has been disclaimed.

4,038,533.—*Ernst H. Dummermuth*, Chesterland, *William A. Donze*, Mentor, and *Timothy Bielawski*, Maple Heights, Ohio. INDUSTRIAL CONTROL PROCESSOR SYSTEM. Patent dated July 27, 1977. Disclaimer filed Jan. 8, 1979, by the assignee, *Allen-Bradley Company*.

Hereby enters this disclaimer to claims 14, 15, 16, 17, 21, and 22 of said patent.

4,082,484.—*John E. McCullough*, Carlisle, Mass. SCROLL-TYPE APPARATUS WITH FIXED THROW CRANK DRIVE MECHANISM. Patent dated Apr. 4, 1978. Disclaimer filed Apr. 16, 1979, by the assignee, *Arthur D. Little, Inc.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,092,078.—*Werner Klotz*, Diepholz and *Georg Kindel*, Lemforde, Germany. ELASTIC CONNECTION FOR AN AXIAL JOINT WITH CONNECTING LINKAGE OF A MOTOR VEHICLE STEERING GEAR. Patent dated May 30, 1978. Disclaimer filed Apr. 12, 1979, by the assignee, *Lemförder Metallwaren AG*.

Hereby enters this disclaimer to the entire term of said patent.

4,106,086.—*Mark Denton Holbrook*, Belle Mead, and *Richard Plumb Fillmore*, Plainfield, N.J. VOLTAGE MULTIPLIER CIRCUIT. Patent dated Aug. 8, 1978. Disclaimer filed Apr. 20, 1979, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to all claims of said patent.

4,140,236.—*Albert R. Uhlig* and *Andrew J. Stoll III*, Toledo, Ohio. METHOD FOR BLOW MOLDING HOLLOW ARTICLE WITH INTEGRALLY BONDED ATTACHMENT, AND ARTICLE. Patent dated Feb. 20, 1979. Disclaimer filed Apr. 13, 1979, by the assignee, *Owens-Illinois, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

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Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
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	Sacramento: California State Library	(916) 323-4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
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Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
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	Columbus: Ohio State University Libraries	(614) 422-6286
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	University Park: The Pennsylvania State Libraries	(814) 865-4861
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Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 21, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-11-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines: Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-2-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	7-6-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-20-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-1-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	11-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	2-3-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-1-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-25-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-17-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-22-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-11-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	4-7-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-30-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	12-20-77

Expiration of patents: The patents within the range of numbers indicated below expire during April 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,027,558 to 3,031,668, inclusive
Plant Patents..... Numbers 2,135 to 2,142, inclusive

REISSUES

JUNE 19, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,033

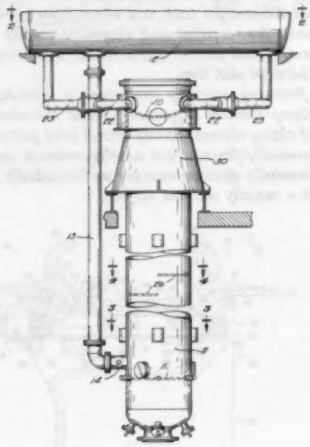
VERTICAL FIRETUBE WASTE HEAT BOILER

Denis G. Csathy; Wendell L. Y. Hung, both of Minneapolis, and Jon M. Heath, New Brighton, all of Minn., assignors to Deltak Corporation, Minneapolis, Minn.

Original No. 3,976,033, dated Aug. 24, 1976, Ser. No. 600,438, Jul. 30, 1975. Application for reissue Mar. 20, 1978, Ser. No. 890,553

Int. Cl.[2] F22B *1/18, 9/04*

U.S. Cl. 122—7 R 5 Claims



1. A boiler having vertical firetubes, upper and lower *tube* sheets to which the opposite ends of the firetubes are connected, an upright substantially cylindrical shell surrounding the firetubes in radially spaced relation to all of them and joined to the peripheral edges of the tube sheets to coact with the tube sheets in defining an upright closed vessel, and means including a downcomer outside the vessel for communicating the top and bottom of the vessel so that during operation of the boiler the vessel contents flow upwardly, said boiler being characterized by:

A. the upper tube sheet having its peripheral edge at a level substantially above its central portion, and being upwardly inclined outwardly from its central portion along every radius to induce radially outward flow of the vessel contents along the underside of the upper tube sheet;

B. an annular baffle projecting radially inward from the shell at a level below the junction of the shell with the upper tube sheet to direct the upwardly flowing vessel contents towards the axis of the vessel and against the center of the upper tube sheet to assure a positive radially outward flow of the vessel contents across the underside of the upper tube sheet that wipes away any steam bubbles in contact therewith; and

[C. the shell having circumferentially spaced holes closely adjacent to and below the peripheral edge of the upper tube sheet through which the steam-water mixture constituting the contents of the vessel leaves the same.]

C. outlet means at the upper end portion of the shell adjacent to its junction with the peripheral edge of the upper tube sheet through which the steam-water mixture constituting the contents of the vessel leaves the same.

Re. 30,034

LOCAL CONDITIONING INDUCTION-TYPE APPARATUS EMPLOYING PRIMARY INLET AIR AS A POWER MEANS FOR CONTROLLING TEMPERATURE

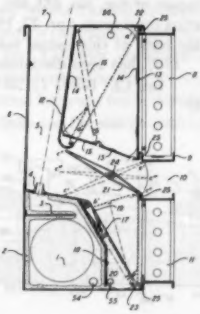
Angelo Serratto, Milan, Italy, assignor to Mario S.p.A., Milan, Italy

Original No. 3,841,398, dated Oct. 15, 1974, Ser. No. 336,181, Feb. 27, 1973. Application for reissue Jul. 8, 1976, Ser. No. 703,390

Claims priority, application Italy, Mar. 1, 1972, 21255 A/72

Int. Cl.[2] F24F *3/04;* F28F *13/12*

U.S. Cl. 165—123 9 Claims



7. A local conditioning induction-type apparatus for conditioning systems with four pipes of secondary water, comprising:

first and second heat exchangers, each arranged to have said secondary water flowed therethrough via a respective pair of said four pipes;

a by-pass flow section located between said first and second heat exchangers;

a primary air flow section through which primary air is directed to flow, and including an aspiration opening through which secondary air flow is aspirated by primary air flow;

first and second damper means for controlling the temperature of said primary air flow for controlling secondary air flow to said aspiration opening through said first and second heat exchangers, respectively;

third damper means for controlling the temperature of said primary air flow by controlling secondary air flow to said aspiration opening through said by-pass flow section;

first and second expansion lung actuator means for alternatively opening and closing said first and second damper means, respectively;

thermostatically controlled valve means for conducting primary air to inflate said first and second expansion lung means in response to temperature conditions in an environment being conditioned by said primary air;

connecting means linking said first and second damper means to said third damper means for controlling the position of said third damper means in accordance with the positions of said first and second damper means; and

interlock means for preventing secondary air from passing contemporarily through said first and second heat exchangers;

wherein said third damper means is biased open at a rest position by a return spring and is rotatably mounted on a pivot about which it is rotatable between two closed

positions symmetrically disposed relative to said rest position; and

wherein said connecting means comprises a sector gear rigidly mounted on said rotation pivot of said third damper means, which sector gear meshes at the same time with two racks, each rack being connected with one of said first and second damper means, said interlock means being provided for preventing any one of said racks from moving when the other rack is operated by the movement of the associated damper means.

Re. 30,035

ARTICULATED LINK CONVEYOR

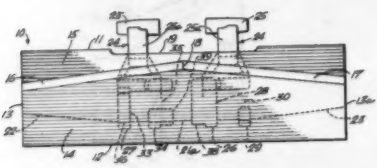
Eldon S. Miller, 5132 San Jose, Tampa, Fla. 33609

Original No. 3,653,494, dated Apr. 4, 1972, Ser. No. 37,155, May 14, 1970. Continuation of Ser. No. 623,485, Oct. 17, 1975, abandoned, which is a continuation of Ser. No. 455,802, Mar. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 769,248, Oct. 21, 1968, Pat. No. 3,513,965, which is a continuation-in-part of Ser. No. 655,401, Jul. 24, 1967, abandoned. Application for reissue Apr. 27, 1977, Ser. No. 791,539

The portion of the term of this patent subsequent to May 26, 1987, has been disclaimed.

Int. Cl.[2] B65G *15/30*

U.S. Cl. 198—850 **2 Claims**



2. A link for articulated-link conveyors comprising, in combination, an elongated link member having an upper support surface and front and back edges, means for interconnecting said link member with successive identical link members so as to form a belt-like conveyor of transversely extending articulated links, said interconnecting means being loose enough to permit angular movements in a common plane of the individual links of a plurality of articulated links to permit their "fanning out" in such angular movements to substantially eliminate separation of their front and back edges, overlapping means comprising a downwardly stepped surface portion in the front portion of said upper support surface and an upwardly stepped surface portion in the rear portion of the bottom of said link member, said downwardly stepped surface portion of one link being of such size and shape as to be nestingly interfitted and overlapped in face-to-face relation with the upwardly stepped surface portion of an adjacent articulated link member, the zone of demarcation between the stepped upper surface portions being defined by a riser surface portion presenting angular inner and outer corner edges therealong, said zone of demarcation defining, along its length, an obtuse angle the apex of which is centrally disposed with respect to the front edge of the link member.

Re. 30,036

VEHICLE WHEELS, SPACERS AND DUAL RIMS

Robert A. DeRegnaucourt, Centerville; John C. Hall, Moraine, and Freddie R. Caudill, Dayton, all of Ohio, assignors to Dayton Walther Corporation, Dayton, Ohio

Original No. 4,049,320, dated Sep. 20, 1977, Ser. No. 592,506, Jul. 9, 1975. Application for reissue May 15, 1978, Ser. No. 905,659

Int. Cl.[2] B60B *23/10*

U.S. Cl. 301—13 SM **7 Claims**

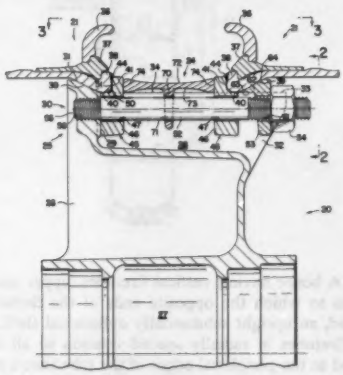
5. A combination of dual inner and outer tire carrying rims separated by spacers and seated and locked by fastening assemblies on a vehicle wheel,

said wheel having a plurality of spaced-apart felloe portions, each said felloe portion having an outwardly opening pocket thereon, the axially inner end of each said pocket terminating at a radially directed surface substantially perpendicular to the rotational axis of said wheel and providing a mounting location for an elongated axially projecting component of said fastening assemblies, each said radially directed surface intersecting a radially inclined felloe surface, the axially outer end of each said pocket having spaced-apart axially directed wing portions providing for outwardly facing dual axially oriented surfaces extending substantially parallel to the rotational axis of said wheel,

each said rim comprising a radially inclined axially inner surface tapering toward an adjacent radially inwardly directed portion oriented substantially perpendicular to the rotational axis of each of said rims with a bore therein for receiving said elongated axially projecting component of said fastening assemblies,

each said spacer being non-compressible and comprising an individual element for each said wheel felloe portion with a bore therein for receiving said elongated axially projecting component of said fastening assemblies and being retained thereby between said rims,

each said fastening assembly comprising a threaded fastener and a clamp element supported by said threaded fastener, each said clamp element having lateral wing portions providing downwardly facing dual axially oriented surfaces, an axially inwardly directed member and a radially outer portion with a radially inclined surface,



whereby, said rims when separated by said spacers are seated and locked on said wheel solely by tightening of each said fastening assembly,

said radially inclined axially inner surface on said inner rim being in mating engagement with one of each said radially inclined felloe surfaces, and said radially inwardly directed portion on said inner rim being in mating engagement with one of each said radially directed pocket surfaces,

the axially inner end of each said spacer being in mating engagement with said radially inwardly directed portion on said inner rim, the axially outer end of each said spacer being in mating engagement with said radially inwardly directed portion on said outer rim,

said radially inclined surface on each said clamp element on each said fastening assembly being in mating engagement with said radially inclined axially inner surface on said outer rim, said downwardly facing dual axially oriented surfaces on said lateral wing portions of each clamp element on each said fastening assembly being in mating engagement with said outwardly facing dual axially oriented surfaces on said axially outer end of each said felloe pocket and said axially inwardly directed member on each said clamp element on each said fastening assembly being in mating engagement with said radially inwardly directed portion on said outer rim.

Re. 30,037

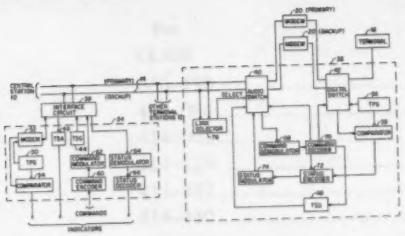
DATA COMMUNICATIONS NETWORK REMOTE TEST AND CONTROL SYSTEM

Larry F. Bass, Mission Viejo, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Original No. 3,920,975, dated Nov. 18, 1975, Ser. No. 523,624, Nov. 14, 1974. Application for reissue Feb. 6, 1978, Ser. No. 875,660

Int. Cl.[2] G08C *25/00*; G06F *11/00*

U.S. Cl. 340—146.1 E 15 Claims



1. A remote test and control system for use with a data communications network interconnecting a central processing station with at least one remote data terminal station, through a pair of communication links either of which may be selected *by a command signal* for passing data information therebetween, with each remote station containing a data terminal and a pair of modems with the data terminal being adapted for connection to the selected communication link through either modem, comprising:

command signal transmitter means for generating and transmitting command signals over at least one of the communication links, each command signal being addressed to a selected remote station;

individual command signal receiver means located at each remote station for receiving the command signals addressed to its associated station, *said receiver means being capable of receiving command signals over whichever link they are transmitted*; and

individual switching means located at each remote station responsive to [one] *a* command signal for connecting the audio terminals and [another command signal for connecting the] digital terminals of either one of the associated station modems between the selected one of the two communication links and the station data terminal, respectively.

PATENTS

GRANTED JUN. 19, 1979

ERRATA

For CLASS	See PATENT NO.
066–190	4,158,292
409–084	4,158,325
414–002	4,158,415
414–139	4,158,416
414–412	4,158,417
414–440	4,158,418
406–089	4,158,469
260–449 R	4,158,637
208–011 LE	4,158,638
585–481	4,158,676
585–456	4,158,677
426–327	4,158,706
360–073	4,158,865
360–099	4,158,867
360–109	4,158,868

PATENTS

GRANTED JUNE 16, 1908

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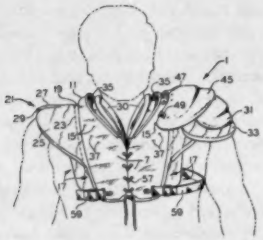
PATENTS

GRANTED JUNE 19, 1979

GENERAL AND MECHANICAL

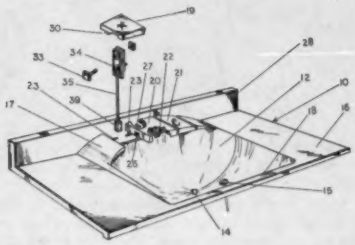
4,158,242
SHOULDER PAD
Hal D. Mitchell, Rolla, Mo., assignor to A-T-O Inc., Willoughby, Ohio
Filed Jun. 6, 1977, Ser. No. 804,012
Int. Cl.[2] A41D *13/00*
U.S. Cl. 2—2 **5 Claims**



1. A shoulder pad for football players comprising a left-hand member adapted to fit over the left shoulder and a right-hand member adapted to fit over the right shoulder, each of said members being a relatively rigid member of generally inverted U-shape as viewed from the side and having a chestplate portion, a backplate portion and an arch integrally connecting said plate portions, said arches being laterally spaced to provide an opening for the neck of the wearer with the spacing such that said arches lie adjacent and relatively close to the neck, said arches being relatively narrow in relation to the width of the shoulders, each of said members having padding on the inside thereof with the padding at the top of the arch extending laterally over the shoulder and having an inner portion generally beneath the arch and an outer portion for covering the outer part of the shoulder, said outer portion being hinged to said inner portion and said outer portion comprising a front section adjacent the chestplate portion, said sections being separate toward their outer ends with the rear edge of said front section forward of the front edge of the back section for allowing the sections to spread apart as they swing upwardly about the hinge upon upward movement of the outer part of the shoulder whereby freedom is provided for raising the arms above a horizontal position by permitting upward movement of the outer part of the shoulder without substantial interference from the outer portion of said padding.

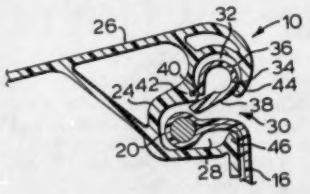
4,158,243
EASY CLEAN LAVATORY
William E. McCann, 540 S. Forest Ave., Mesa, Ariz. 85204
Filed Jul. 29, 1977, Ser. No. 820,095
Int. Cl.[2] E03C *1/182, 1/186*
U.S. Cl. 4—166 **9 Claims**

1. A lavatory comprising:
a vertically arranged sump defining an opening having a rim around its periphery,
said rim comprising first and second portions with said second portion positioned immediately adjacent to a user,
said first portion of said rim comprising at least one rotatively mounted part movable out of alignment with said rim to function as a water valve control lever,
said first portion of said rim overhanging and extending inwardly of the walls of said sump,
means for pivotally connecting said part of said first portion of said rim at one point to a stem of a water valve and hingedly connecting said part at a point spaced therefrom to said rim,
said means comprising a pin secured to said rim, and
a spring fitted at least partially around said pin and fastened



to said first part for normally biasing said first part to a position conforming with the outline of said first portion of said rim.

4,158,244
POOL LINER RETAINER
Gunter Stefan, Toronto, Canada, assignor to Timerax Holdings Ltd., Georgetown, Canada
Filed Aug. 18, 1977, Ser. No. 825,874
Claims priority, application Canada, Jul. 20, 1977, 283115
Int. Cl.[2] E04H *3/16*
U.S. Cl. 4—172.21 **5 Claims**



1. A pool liner retainer comprising: an elongate retaining element defining a holding channel adapted to accommodate a liner bead and a generally cylindrical hinge channel communicating with the holding channel, said hinge and holding channels defining a longitudinal outward slot for insertion of the liner bead into the holding channel;
an elongate U-shaped insert located in the hinge channel, the insert having an outward closing element depending from the hinge channel to partially close said slot and an inwardly disposed base; said base defining a longitudinal rib, and the hinge channel defining a locating groove, the rib being located in the groove to resist rotation of the insert in the hinge channel;
means for biasing the closing element toward said slot; and
the hinge channel defining stop means engaging the closing element to prevent outward movement thereof into the slot, the insert thereby being inwardly hingeable for insertion of a liner bead and outwardly biased into engagement with the stop means to partially close the slot and retain the liner bead in the holding channel.

4,158,245
SWIMMING DEVICE

Robert K. Cunningham, P.O. Box 8155, 600 Goff Mountain Rd., Nitro, W. Va. 25143

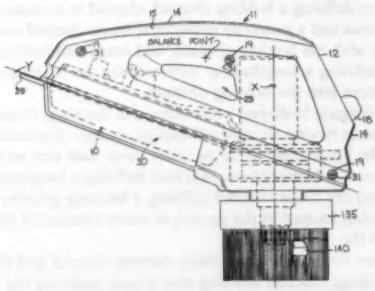
Filed Dec. 28, 1977, Ser. No. 865,288
Int. Cl.[2] A63B *35/00*
U.S. Cl. 9—301 4 Claims

1. A swimming device comprising:
a buoyant body platform having opposite top and bottom side surfaces, and leading and trailing ends;
arm loops on the top side surface adjacent the leading end, and a body strap on said surface adjacent said trailing end;
a pair of longitudinally extending, tubular cylinders fixedly mounted on the bottom side surface;
each of said cylinders having an open forward end, and an aft end, the aft end having an end wall;
the end wall having central aperatures therein, and having an opening therein spaced from said central aperatures;
fluid release jet nozzles mounted in said openings;
a piston mounted for sliding movement in each of said cylinders, the piston having forward and aft ends, a side wall and sliding contact with the cylinders, and each having a central hub, and radial struts connecting the hub and the side wall and being opened between the struts to provide for fluid passage between the struts;
the hubs having central openings therein;
a pulley wheel mounted on the bottom side surface of the platform forward of the cylinders;
a cable trained about the pulley wheel, extending through the central openings of the hub and being fixedly secured thereto, and having cable ends which extend outwardly of the aft ends of the cylinders;
stirrups on the cable ends;
a flap valve formed of a resilient material on the aft ends of the piston to close the piston when propelled in the aft direction and to open to emit fluid passage when propelled forwardly.

4,158,246
PORTABLE CORDLESS SCRUBBER

Robert J. Meadows, and Stephen D. Doolittle, both of Danville, Va., assignors to Disston, Inc., Greensboro, N.C.

Filed Sep. 7, 1977, Ser. No. 831,246
Int. Cl.[2] A46B *13/02*
U.S. Cl. 15—28 16 Claims

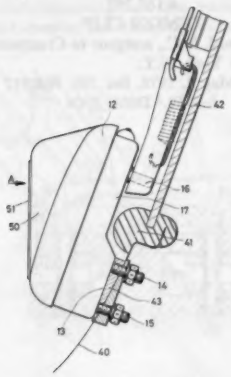


1. A portable, battery-operated device adapted to drive rotating brushes, pads, and the like, comprising:
(a) an integral molded housing formed of secured half sections, said housing having in an upper intermediate portion thereof a molded handle grip portion, having in a forward portion thereof an internal vertical compartment for receiving a drive motor and associated gear and drive shaft subassembly and having a lower rearward pocket with an outwardly open side and peripheral side walls, a rectangular base wall located opposite said open side and rigid with said housing and forming the base of said pocket, said base wall providing receptacle openings adapted to receive a pair of AC household type prongs and with circuit means to connect such inserted prongs to said motor;
(b) a rectangular box-shaped battery pack fitting and movable within said housing pocket side walls towards and from said base wall, said pack mounting a battery, rectifier means connected to the battery for recharging the battery, a pair of AC household type prongs projecting from one flat, substantially rectangular sidewall thereof and a switch mounted within the pack, said switch having a normal position which acts to connect said battery through said rectifier means to said prongs enabling said pack to be recharged by insertion of said prongs in an AC household type receptacle supply and having a second position which said switch is adapted to assume by being engaged whenever said pack prongs are inserted into said housing receptacle openings to connect said battery to said prongs to power said motor;
(c) actuator means arranged on said pack and pocket to move said switch to its said second position when said prongs are fully inserted into said housing receptacle openings;
(d) latching means for securing said pack in said pocket when said pack is fully inserted into said housing pocket;
(e) a drive motor and associated gear and drive shaft subassembly mounted in said forward compartment, said subassembly including:
(i) a drive motor having a drive shaft and a first drive gear mounted thereon;
(ii) reducing gear means driven by said first motor drive gear and providing a second drive gear operating at a speed reduced from that of said first motor drive gear;
(iii) an integral outer gear-drive shaft member comprising a vertical hollow shaft member having an enlarged circular upper portion formed with an internal ring gear engaging and driven by said second drive gear at a selected speed in one direction and a lower drive portion adapted for being snap-fit connected to a correspondingly formed brush, pad, or the like, for being driven thereby;
(iv) an integral inner gear-drive shaft member mounted and rotatable within said outer gear-drive shaft member and comprising a vertical shaft member having an enlarged upper circular portion formed with an external outer gear and driven by said second drive gear at a selected speed in an opposite direction to that of said outer gear-drive shaft member and having a lower drive portion adapted for being snap-fit connected to a correspondingly-formed brush, pad, or the like, for being driven thereby;
(v) gear housing means secured to and below said motor and providing mounting means for said reducing gear means, said outer and inner gear drive shaft members; and
(f) a positionable control switch and circuit means enabling said switch to control the connection between said pack prongs and motor when said pack is installed in said pocket.

4,158,247
REAR WINDOW CLEANING APPARATUS FOR AUTOMOTIVE VEHICLES

Dieter Hanselmann, Aldingen; Hans Prohaska, and Karl-Friedrich Schubert, both of Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed May 31, 1977, Ser. No. 801,998
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634271
Int. Cl.[2] B60S *1/08*
U.S. Cl. 15—250.3 2 Claims



1. Apparatus for cleaning the rear window of an automotive vehicle wherein said window is mounted within the general plane of the rear frame of the vehicle and separated therefrom by a toroidal gasket which encircles said window and engages said frame and said window, said apparatus comprising, in combination:

a housing rigidly mounted to said frame on an external surface thereof and extending outwardly from said frame, said housing having a projection extending over said gasket and into the area of said window;

a motor mounted in said housing;

a wiper shaft mounted in said projection of said housing and extending toward said window;

means for mechanically coupling the output of said motor to said wiper shaft for rotating said shaft through an oscillatory angular swing in response to said output of said motor; and,

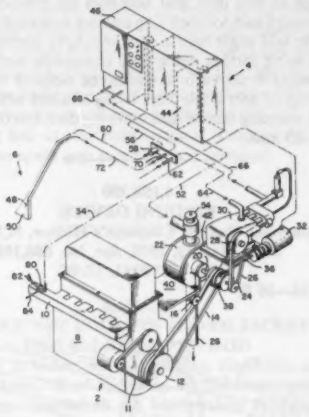
wherein said projection is spaced apart from said plane of said rear frame a distance at least equal to the outward extension dimension of said gasket thereby to provide clearance for said gasket.

4,158,248
MOBILE CLEANING UNIT

Michael C. Palmer, 6209-183rd Pl., SW., Lynnwood, Wash. 98036

Filed Feb. 14, 1977, Ser. No. 768,389
Int. Cl.[2] A47L *5/12*
U.S. Cl. 15—321 4 Claims

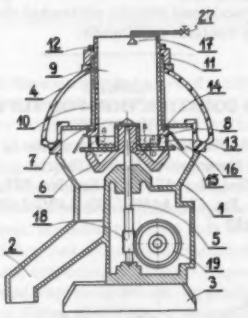
1. Self-contained mobile cleaning apparatus located within and forming a permanent part of a vehicular structure including the frame, wheels, and engine and a cargo carrying area, wherein the majority of the cargo area continues to be available for use as designed and the necessary operation and control mechanisms are mounted within the engine compartment said apparatus comprising: storage means and supply means for the necessary cleaning agents and the soiled, returned fluid and heating means for the cleaning agents within the cargo area, means for creating a positive pressure and means for creating a negative pressure and driven by the engine mounted within the engine compartment, selectively engageable clutch means mounted within the engine compartment driving the means for creating negative pressure, remote, portable cleaning means for delivering cleaning agents to the area to be cleaned and for returning the soiled fluid, conduits functionally interconnecting the means for creating positive pressure and negative pressure, storage and supply means and the remote cleaning means for conducting the cleaning solution and the soiled liquid, and means preventing use of the apparatus unless the vehicle is parked.



4,158,249
APPARATUS FOR SHELLING MARINE CRUSTACEA

Zbigniew Jaśniewicz, Gdańsk-Oliwa; Jan Knyszewski, Gdynia; Tadeusz Ośrodek, Gdańsk-Oliwa; Zdzisław Kielczynski, and Lech Stefanski, both of Gdynia, all of Poland, assignors to Przedsiebiorstwo Polowow Dalekomorskich I Uslug Rybackich "Dalmor", Gdynia, Poland

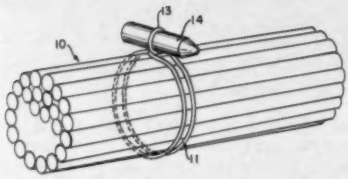
Filed Oct. 20, 1977, Ser. No. 844,104
Claims priority, application Poland, Nov. 3, 1976, 193450
Int. Cl.[2] A22C *29/02*
U.S. Cl. 17—73 8 Claims



2. An apparatus for shelling meat of marine crustacea, especially of antarctic krill, employing, a rotatable disc for ejection crustacea therefrom by centrifugal force; a chute mounted above said disc for delivering crustacea onto said working disc, a toothed ring provided at the bottom of said chute for cutting crustacea shells; bars mounted to said chute for removing shells from the meat of crustacea; and angle bars cooperating with said bars for deflecting a mixture of meat and of shells to an outlet passage of a casing housing said disc, wherein: said disc is mounted horizontally on a rotor fastened to shaft means

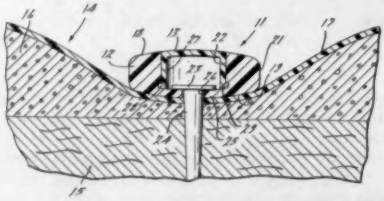
and is connected to a drive means assembly; said chute is vertically disposed above the disc within a sleeve permitting adjustment of the distance between the chute and said disc and is retained within said sleeve by means of a threaded retaining ring; said toothed ring being disposed to surrounding the axis of rotation of said disc, and said bars are positioned to annularly surround said toothed ring and are mounted on a collar of said chute, said angle bars in turn annularly surround said bars; said bars being further defined by chamfered surfaces forming an apex angle to the vertical within the range of 10° to 30°; and tip portions of said angle bars being situated below the outer edge of a working face of said working disc, at a distance of not less than 20 mm.

4,158,250
BINDING DEVICE
Arthur Ringwald, Box 95, Coeyman's Hollow, N.Y. 12046
Filed Mar. 13, 1978, Ser. No. 886,158
Int. Cl.[2] F16L *33/00*
U.S. Cl. 24—16 R **1 Claim**



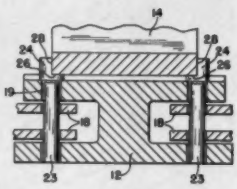
1. A binding device for circumferentially containing a bundle comprising:
(a) a closed-loop elastic band disposed around the bundle in stretched condition and having first and second end loop portions,
(b) said first end loop portion of said band extending through said second end loop portion,
(c) said second end loop portion being elastically tightened directly around said first end loop portion, and
(d) a single pin removably disposed through said first end loop portion to prevent said first end loop portion from withdrawing out of said second end loop portion,
(e) said pin being of dowell material and having a substantially pointed end,
(f) whereby said band remains contracted about and circumferentially contains said bundle.

4,158,251
BUTTON CONSTRUCTION FOR TUFTED BOAT UPHOLSTERY
George Howell, Windsor, Canada, assignor to Detroit Marine Engineering Corporation, Detroit, Mich.
Filed Mar. 17, 1978, Ser. No. 887,522
Int. Cl.[2] A44B *1/00*; A47G *3/00*
U.S. Cl. 24—152 **3 Claims**



1. An upholstery button construction comprising a holding member with upper and lower surfaces having a predetermined thickness and a central recess therein having a side wall of constant radial size over the major portion thereof, said recess having a single relatively thin continuous central bottom wall with central means for permitting a fastener such as a headed nail to penetrate through the wall and secure the holding member to an upholstery backing board, said wall being imperforate around said central means, and a hollow cover member inserted in said recess, the side wall of said cover member having a dimension such that it engages said recess side wall and having a height such that the entire end wall of the cover member is flush with said upper surface of the holding member when the cover member is inserted in the recess.

4,158,252
TENTER CLIP
Jack Broome, Concord, N.C., assignor to Crompton & Knowles Corporation, New York, N.Y.
Filed May 3, 1978, Ser. No. 902,517
Int. Cl.[2] D06C *3/04*
U.S. Cl. 26—93 **4 Claims**



1. A tenter clip comprising:
(A) a material gripping element comprising:
(1) means for gripping material; and a portion for engaging the guide rail of a tenter;
(B) a base element comprising:
(1) an upper surface for engaging a portion of the bottom surface of the material gripping element;
(2) a guide face which lies in a plane at an angle from the upper surface for engaging the guide rail of a tenter; and
(3) projections extending from opposite ends of said base element and having openings therein for connection to adjacent links of a tenter chain;
(C) screw means for connecting the material gripping element to the base element; and
(D) pintle means, each of which, comprising:
(1) a portion for extending through the openings in the projections of said base element and through openings in adjacent chain links for connecting the base element to said adjacent links;
(2) a head portion which comprises:
(a) a first surface which extends between the gripping element and the base element when the base element is connected to the gripping element; and
(b) a second surface which extends in a plane at a right angle to said first surface, along one side of said gripping element when the gripping element is connected to said base element; whereby said pintles, in cooperation with said screw means, maintain said gripping element in proper alignment with said base element and also connects said base element to adjacent links of a tenter chain.

4,158,253
SIMPLIFIED YARN COILER
Stephen B. Gaghan, Franklin Lakes, N.J., and Josiah W. Stahl, Jr., Taylors, S.C., assignors to Greenville Steel Textile Machinery Corp., Greenville, S.C.
Filed Jan. 12, 1978, Ser. No. 868,918
Int. Cl.[2] B65H *54/00*
U.S. Cl. 28—289 **14 Claims**

1. A coiling machine for textile material comprising

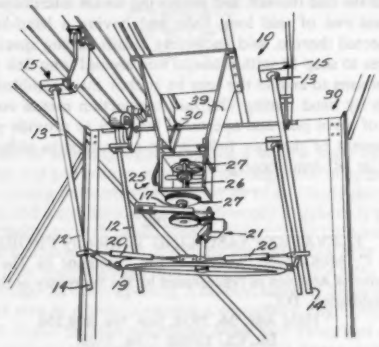
a plurality of depending tubes, each having an upper and lower end;

means for mounting the upper end of each of said tubes for swiveling movement such that the lower end of each tube may move in a circular path to dispense textile material from said lower end in the form of a coil;

a first vertical, drive, shaft;

a substantially horizontally disposed frame member having connections to accessory components consisting of operative connections to each of said plurality of tubes adjacent the lower ends thereof, and to said first shaft;

said connection from said frame to first shaft comprising means interconnecting said first vertical, drive, shaft to said frame member for converting rotational movement of



said first shaft about a vertical axis into movement of said frame member so that the lower ends of said tubes are simultaneously moved in a circular path to dispense textile material from each lower end in the form of a coil; and

drive train means for imparting rotary driving motion to said first vertical drive shaft, said drive train means including shaft means consisting of a single, motor-driven, horizontal shaft disposed vertically above said frame member and out of interfering engagement with said tubes; means for transforming rotation of said horizontal shaft about a horizontal axis into rotation of a second vertical shaft about a vertical axis; and gear reduction means interconnecting said first and second vertical shafts for rotating said first shaft at a lower angular velocity than said second shaft.

4,158,254

METHOD OF MAKING A SPARK GAP DEVICE FOR A CATHODE RAY TUBE SOCKET

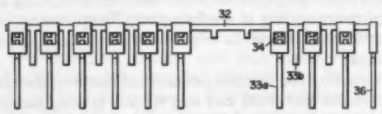
Masayuki Uda, Osaka, Japan, assignor to Hoshidenki-Seizo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 805,481, Jun. 10, 1977, Pat. No. 4,119,878. This application Apr. 20, 1978, Ser. No. 897,984

Claims priority, application Japan, Jun. 18, 1976, 51-80043[U]

Int. Cl.[2] H01T *3/00*; H02H *9/06*

U.S. Cl. 29—25.18 **5 Claims**



1. A method of making a spark gap device for a cathode ray tube socket, comprising:

a first step of forming from a flexible and substantially flat sheet of metal and a rectangular frame having a plurality of arms extending between longer sides at suitable intervals and spark gaps, each formed in the vicinity of one end of at least some of the arms;

a second step of molding a plurality of molding pieces on the arms containing the spark gap for fixing at least one of the spark gap portions; and

a third step of cutting off the longer side of the frame at the side of the other ends of the arms containing the spark gaps and cutting off all but one of the unnecessary arms having no spark gaps in order to use the remaining longer side of the frame as a coupling link and the portions of the arms having the spark gaps on the opposite side from the coupling link as electrode terminal portions and the arm having no spark gap as a common terminal.

4,158,255

CABLE NET COOLING TOWER JACKET INSTALLATION METHOD

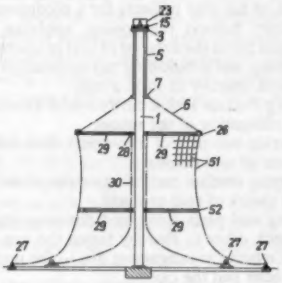
Michael Doll, Erfelden; Anton Heseding, Goddelau, and Erich Jasch, Leeheim, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed May 4, 1977, Ser. No. 793,491

Claims priority, application Fed. Rep. of Germany, May 12, 1976, 2621047

Int. Cl.[2] B23P *15/00*; E04B *1/35*

U.S. Cl. 29—428 **9 Claims**



1. In a method for erecting the jacket of a cable net cooling tower which has a center mast, which method includes hoisting the jacket by lifting forces produced by hoisting means located at the top of the center mast, the improvement comprising: suspending the jacket from pulling members composed of threaded steel rod units, each unit being composed of a succession of individual steel rods joined together at their ends by threaded sleeves, the individual steel rods including setting elements comprising nuts in movable threaded engagement with the steel rods; supporting during the suspending step the nuts on a perforated plate mounted on a supporting base; transmitting the lifting forces to the steel rod units by the setting elements detachably connected to the steel rods;

interposing a supporting block having an effective height at least equal to the combined length of a threaded sleeve and a nut between the perforated plate and the supporting base whenever a threaded sleeve moves into the space

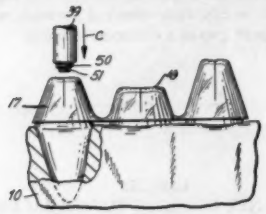
that would be occupied by the perforated plate when resting directly on the supporting base; and removing the uppermost individual steel rod of each unit when it is no longer in force transmitting relation with the hoisting means; and wherein the hoisting means are constituted by lifting jacks.

4,158,256

DETACHABLE FASTENER FOR A DENTAL CAP AND PROSTHODONTIC METHOD UTILIZING THE SAME

Lawrence Wiland, 42-45 Kissena Blvd., Queens, New York, N.Y. 11355; Robert Humphrey, 227 Corlies Ave., Pelham, N.Y. 10803, and Peter Consiglio, Lindenhurst, N.Y., assignors to Lawrence Wiland, Queens and Robert Humphrey, Pelham, both of, N.Y.

Filed Jul. 13, 1977, Ser. No. 815,173
Int. Cl.[2] A61C 5/08
U.S. Cl. 32—12 **13 Claims**



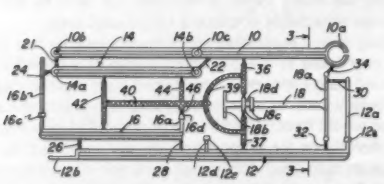
1. A prosthetic method of repairing a tooth, comprising the steps of:
(a) preparing a tooth to be repaired;
(b) forming an elongated recess in the prepared tooth;
(c) providing a coping for placement over the prepared tooth;
(d) forming the coping with a bore which extends in direction of the elongation of the recess;
(e) providing a cap for placement over the coping by inserting a stud into said bore for a depth such that a trailing portion of the stud projects for a predetermined distance outwardly beyond the coping, applying a hardenable substance about the exterior of said projecting portion and the coping, and substituting cap material for said hardened substance, thereby to form a cap;
(f) forming the cap with a cavity which extends in direction of the elongation of the recess;
(g) mounting one part of a two-part detachable fastener in said bore of said coping;
(h) mounting another part of a two-part detachable fastener in said cavity of said cap; and
(i) moving said parts along said direction into engagement with each other to thereby fasten the cap to the coping free of relative misalignment due to the mutual alignment of the bore and the cavity.

4,158,257

PANTOGRAPH INTEGRALLY FORMED OR MOLDED OF PLASTIC MATERIAL

Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.

Continuation of Ser. No. 791,006, Apr. 26, 1977, abandoned, which is a continuation-in-part of Ser. No. 715,283, Aug. 18, 1976, abandoned. This application Sep. 15, 1978, Ser. No. 942,619
Int. Cl.[2] B43L 13/10
U.S. Cl. 33—25 R **5 Claims**



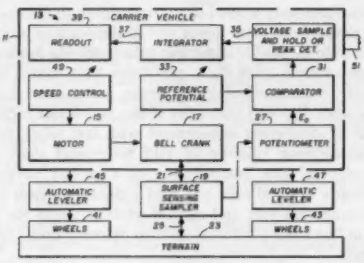
1. A one-piece molded unit substantially rectangular in plan view having interconnected portions adapted for construction into a hand-held pantograph, said portions comprising first and second parallel interconnected long links, said first long link having a writing instrument holder at one end thereof, first connection means at the other end thereof and second connection means intermediate the link end, said second long link having a first connection means at one end thereof and second connection means at the other end thereof, first and second interconnected short links each having first and second connection means at the respective ends thereof said first and second interconnected links interconnected with said first and second long links and pointer means extending perpendicularly to one of said short links at one of the ends thereof adapted to snap fit into one of said connection means on the other short link at the end thereof, and anchoring means interconnected to at least one of said long links and having a hand-held rest connected thereto, said anchoring means having special apart flanges to snap fit within one of said second long link connection means to enable the user to anchor the assembled pantograph by hand during use, said connection means consisting only of pivot pins and apertured bearings to provide pivoting movement of the four links when assembled in either right-hand or left-hand configuration.

4,158,258

ELEVATION SAMPLING TERRAIN PROBE

John C. McKechnie, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1978, Ser. No. 899,194
Int. Cl.[2] G01B 7/34, 7/28
U.S. Cl. 33—174 P **25 Claims**



1. A surface elevation measuring system, comprising in combination:
a rotatable bell crank;
means connected to said bell crank for the rotational driving thereof at a preset speed;
means having a frame effectively connected to said rotatable bell crank and the aforesaid bell crank driving means for the supporting thereof, said means being adapted for traversing predetermined paths along a surface whose elevation is being measured;
a surface sensing sampler effectively connected to said rotatable bell crank, said surface sensing sampler being adapted for reciprocating in a substantially linear manner along a predetermined axis in response to the rotation of said bell crank;
a connecting rod assembly connected between the aforesaid rotatable bell crank and said surface sensing sampler;
means disposed in the frame of the aforesaid supporting means and in contiguous disposition with said surface sensing sampler for effectively guiding said surface sensing sampler in a linear manner along said predetermined axis, as the aforesaid bell crank rotates; and
means effectively connected between the frame of said supporting means and said surface sensing sampler for pro-

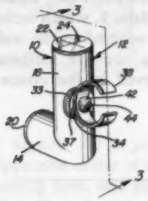
ducing a voltage signal that is proportional to the relative dispositions thereof.

4,158,259

MARBLE SHOOTING SIGHT

Egon Hansen, 1507-78th St., Kenosha, Wis. 53140, and Gregg E. Hansen, 8735-44th Ave., Kenosha, Wis. 53142

Filed Feb. 7, 1978, Ser. No. 875,862
Int. Cl.[2] G02B *23/00*
U.S. Cl. 33—262 **7 Claims**



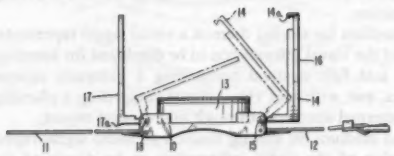
7. A marble shooting sight including a hollow body having front, rear, top and bottom sides and defining a pair of openings therein opening outwardly of the interior of said body through said front and top sides in directions disposed at generally right angles relative to each other, substantially planar light reflective means mounted within said body for reflecting light rays entering said body through one opening outwardly from said body through the other opening, a support member defining an elongated area in which to receive a supportive finger portion with said finger portion extending along said elongated area and said support member supported from said finger portion, mounting means mounting said support member on the rear side of said body for adjusted angular displacement of said support member relative to said body about an axis extending in a front-to-rear direction relative to said body and transversely through said elongated area.

4,158,260

WRIST COMPASS AND TRANSIT

Richard T. Benger, Weston, Mass., and Benjamin D. Pollack, P.O. Box 417, Bantam, Conn. 06750, assignors to Benjamin D. Pollack, Bantam, Conn., by said Richard T. Benger

Filed May 2, 1977, Ser. No. 792,794
Int. Cl.[2] G01C *17/06*
U.S. Cl. 33—272 **2 Claims**



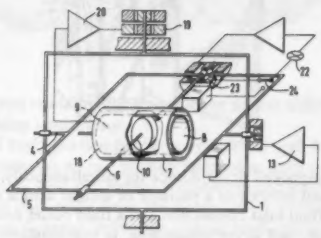
1. A wrist compass comprising, a base member having straps at each side for detachably securing the base member to the user's wrist, a compass body, said compass body and said base member having complementary interengaging surfaces for detachably securing said compass body to said base member by rotating said body relative to said member from an attached position to a detached position, said base member having a transparent sighting lens carrying element that is pivotally secured to one side of the base to overlie in a folded position the compass face when said compass is attached to said base and to be movable from the folded position to an erect sighting position, a transparent sighting line element is pivotally secured to an opposite side of the base member in a manner to overlie in a folded position the folded position of said lens carrying element and compass face when said compass is attached to said base and to be movable from the folded position to an erect sighting position, whereby said compass is visible when both said lens carrying element and said sighting element are in folded position.

4,158,261

GYRO COMPASS AND DIRECTIONAL GYRO ARRANGEMENT

Werner Auer, Weisenbach, Fed. Rep. of Germany, assignor to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,301
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1977, 2730616
Int. Cl.[2] G01K *19/384*
U.S. Cl. 33—324 **10 Claims**



1. In a gyro arranged to be mounted in a vehicle and operable selectively as a directional gyro or as a gyro compass, which gyro includes:

a gyro rotor rotatable about a horizontal spin axis;

an inner gimbal supporting the gyro rotor via its spin axis and pivotal about an axis which is maintained vertical when the gyro is operating as a gyro compass;

means defining a yieldable restraint tending to maintain the inner gimbal in a selected position and opposing pivoting of the inner gimbal about its axis away from the selected position;

a first position sensor disposed for providing a signal in dependence on such pivoting of the inner gimbal;

a second gimbal supporting the inner gimbal via its axis and pivotal about an axis parallel to the rotor spin axis when the inner gimbal is in its selected position;

an outer gimbal supporting the second gimbal and pivotal about an axis oriented approximately parallel to the vertical axis of the vehicle when the vehicle is upright;

follow-up means connected between the position sensor and the outer gimbal axis for pivoting the outer gimbal about its axis in response to pivoting of the inner gimbal relative to the second gimbal; and

drive means selectively connected for placing the second gimbal into a position where the axis of the inner gimbal is vertical when the gyro is to operate as a gyro compass, and for placing the second gimbal into a position where the axis of the inner gimbal is substantially inclined to the vertical when the gyro is to operate as a directional gyro, the improvement wherein said gyro further comprises: an intermediate gimbal disposed between said second gimbal and said outer gimbal, supporting said second gimbal via its axis, and having a pivot axis which is supported by said outer gimbal and which extends orthogonally to the axes of said second gimbal and said outer gimbal, said second gimbal and intermediate gimbal being so arranged that the axis of said inner gimbal is vertical when said gyro is operating as a gyro compass; and control means includng a verticality sensor associated with said intermediate gimbal and arranged for maintaining the axis of said second gimbal horizontal when said gyro is operating as a directional gyro, and wherein said drive means are arranged for placing the axis of said inner gimbal parallel to the axis of

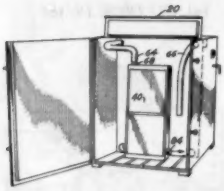
said intermediate gimbal when said gyro is operating as a directional gyro.

4,158,262

ELECTRIC DRYER CONSTRUCTION FOR VEHICLE RADIATORS

James V. Grasso, Omaha, Nebr., assignor to Inland Manufacturing Company, Omaha, Nebr.

Filed Jan. 11, 1978, Ser. No. 868,500
Int. Cl.[2] F26B *25/06*
U.S. Cl. 34—202 9 Claims



1. An improved dryer device for simultaneously drying the exterior and interior of a radiator or similar article of the type having a fluid inlet connection and a fluid outlet connection to the interior, said dryer comprising, in combination:

a cabinet;

a substantially vertical interior cabinet wall subdividing the cabinet into two separate compartments, one of said compartments comprising an enclosed dryer compartment;

an access door in the cabinet to the dryer compartment;

a single blower in the other compartment;

a bifurcated duct from the blower having one passage to the dryer compartment for directing drying air into the compartment to dry the exterior of the article in the compartment and having a second passage to a manifold assembly, said manifold assembly including a manifold for receiving the drying air from the blower and at least one hose means from the manifold to the interior of the dryer compartment for attachment to an inlet connection of an article within the dryer compartment to thereby direct drying air into the interior of said article to dry the interior of said article; and

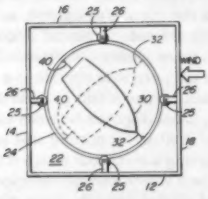
at least one combination air and water discharge outlet at the bottom of the dryer compartment.

4,158,263

SAILING SIMULATOR

Clyde R. Weihe, Jr., 17 Lindbergh Ave., Needham, Mass. 02194

Filed Sep. 26, 1977, Ser. No. 836,371
Int. Cl.[2] G09B *9/06*
U.S. Cl. 35—11 A 2 Claims



1. A sailing simulator comprises;

(a) a reservoir;

(b) a circular guide rail secured to the reservoir in a movable manner;

(c) a sailboat having a transom and a tiller, the sailboat disposed in the reservoir;

(d) means to propel the boat secured to the boat, said means independent of a movement of air, said means to propel including a propeller, the propeller fixed to the boat and lying in a plane perpendicular to the transom of the boat and means to rotate the propeller in one direction when the tiller is moved to starboard and means to rotate the propeller in a reverse direction when the tiller is moved to port; and

(e) means to secure the boat fore and aft to the rail to allow non-linear movement of the boat within the reservoir and to prevent the boat from contacting the guide rail whereby sailing maneuvers may be simulated.

2. The simulator of claim 1, which includes;

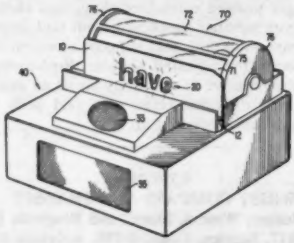
a plurality of rollers secured to the walls of the reservoir, said rollers having concave surfaces and wherein the guide rail is received in the concave surfaces of the wheels.

4,158,264

AUDIO-VISUAL TEACHING APPARATUS

Joy H. Orth, 3906 Sabal Palm Dr., Vero Beach, Fla. 32960

Filed Aug. 31, 1977, Ser. No. 829,576
Int. Cl.[2] G09B *5/04*
U.S. Cl. 35—35 C 17 Claims



1. A teaching apparatus of the type utilizing concurrent audio and visual reinforcement to improve the learning of information by the student, said teaching apparatus comprising in combination:

a first medium for storing thereon a visual signal representative of the visual information to be displayed for learning, with said first medium comprising a generally opaque object, and with said visual signal comprising a plurality of patterned apertures through said opaque object;

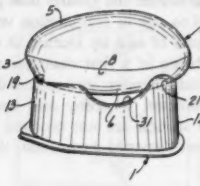
a second medium for storing thereon an audio signal representative of the audio information to be displayed for learning;

audio reproduction means for coacting with said audio signal on said second medium for producing an audible display of the audio information to be learned by the student;

visual reproduction means for coacting with said visual signal on said first medium for producing a visual display of the visual information to be learned by the student, with said visual reproduction means comprising light means for providing illumination through said patterned apertures; and

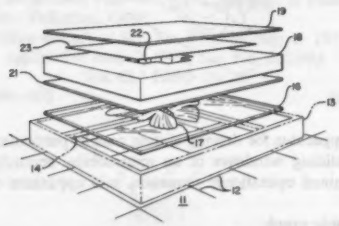
color means coupled to said visual reproduction means for allowing the student to select one of a plurality of colors in which the visual information is displayed, whereby the student may select the color in which the visual information is to be displayed in order to improve the learning process.

4,158,265
UNIVERSAL PRESSING HAM SUPPORT
June E. Kroenke, 509 Oakwood Dr., Hartland, Wis. 53029
Filed Feb. 6, 1978, Ser. No. 875,517
Int. Cl.[2] D06F *81/00, 81/06*
U.S. Cl. 38—135 8 Claims



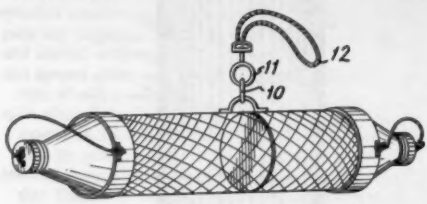
1. In a universal support for a pressing ham accessory adapted to support apparatus either of an egg-shaped pressing ham or a curved pressing ham, said support having first and second opposed end walls and opposed sidewalls, said end walls having upper recesses of different curvature and selected to support the pressing ham, said sidewalls having similar recesses of different depth and configuration to correspondingly accomodate opposite different surfaces of said pressing ham for supporting of the opposed surfaces of the ham in raised exposed relationship, said end walls and sidewalls defining a central opening within which the pressing ham can be located and supported in a vertical upright position, the distance between said end walls and said sidewalls being constructed and located to provide different openings for the tear-drop pressing ham and the curved pressing ham.

4,158,266
SHOCK ABSORBENT DISPLAY MOUNTING APPARATUS AND METHOD
Richard L. Gilmour, P.O. Box 154, Boulder Creek, Calif. 95006
Filed Oct. 29, 1976, Ser. No. 736,876
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—152 12 Claims



1. A mounting assembly for holding an article to be displayed, comprising a frame, a transparent front plate, a back plate, means for retaining said back plate within said frame, a front lip on said frame disposed to retain said front plate therein, a resilient body within said frame retained in compression between said front and back plates, said resilient body having a cavity therein adapted to receive the article to be displayed, and a resilient sheet between said transparent front plate and said resilient body overlying said cavity, whereby the article to be displayed when placed between said resilient body and said transparent front plate is viewed therethrough and held firmly thereagainst by compressive force exerted against said resilient body and resilient sheet.

4,158,267
LITTLE BUGGER INSECT CARRYING AND DISPENSING CONTAINER
Charles W. Farnsworth, 27 S. Second St., Frackville, Pa. 17931
Filed Sep. 24, 1976, Ser. No. 713,031
Int. Cl.[2] A01K *97/04*
U.S. Cl. 43—55 1 Claim

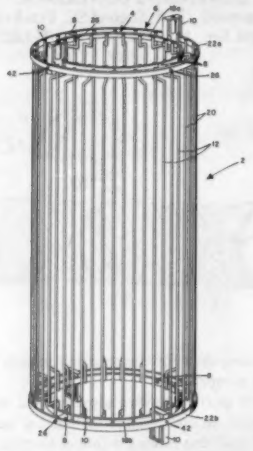


1. A live bait container for transporting insects utilized in the sport of fishing comprising:
A central body portion having a cylindrical wall formed of mesh material; an end portion fastened at each end of the cylindrical wall and having a funnel-shaped body portion tapering outwardly from the central body portion;
A partition fastened inside the central body portion at the middle portion thereof and dividing the interior of the central body portion into two separate and equally sized chambers;
a neck portion in the outer end of each of the end portions and threaded to receive a cap;
A threaded cap for each neck portion;
A fastening cord attached between each cap and its related end portion to prevent loss of the cap;
A wire support attached at the outside of the middle of the body portion over the dividing partition;
A carrying strap fastened to said wire support to enable the container to be easily transported;
whereby different insects may be simultaneously carried in the separate compartments and selectively released through the separately capped end portions.

4,158,268
ELECTRICAL GRILL ASSEMBLY AND ASSOCIATED INSULATOR SPACER
Sal G. DeYoreo, Andover, Mass., assignor to Automatic Radio Mfg. Co., Inc., Melrose, Mass.
Filed Aug. 19, 1977, Ser. No. 826,040
Int. Cl.[2] A01M *1/22*
U.S. Cl. 43—112 3 Claims

1. An electrical grill assembly for use in an apparatus for electrically exterminating insects, comprising: inner and outer generally cylindrical metal grill members, each grill member having longitudinally extending circumferentially. spaced ribs which are joined to axially spaced circular bands, the circular bands of said inner grill member being of lesser diameter than the circular bands of said outer grill member to thus provide annular spaces therebetween, and, a plurality of non-metallic insulator spacers interposed between said inner and outer grill members at circumferentially spaced locations, the circular bands of said inner and outer grill members being received in

grooves in oppositely disposed side faces on said insulator spacers, said insulator spacers having protrusions extending



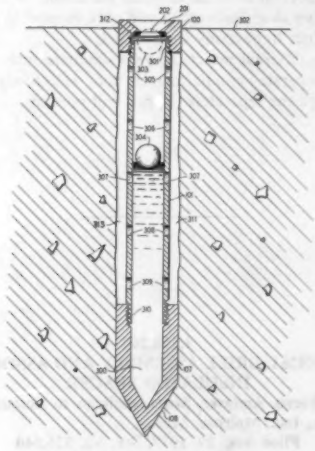
from the bases of said grooves into radially aligned openings in the circular bands of said inner and outer grill members.

4,158,269

NUTRIENT DISPERSAL DEVICE

John G. Williams, and Vera Williams, both of 104 Main Ave., Ocean Grove, N.J. 07756

Filed Aug. 15, 1977, Ser. No. 824,646
Int. Cl.[2] A01G *29/00*
U.S. Cl. 47—48.5 **5 Claims**



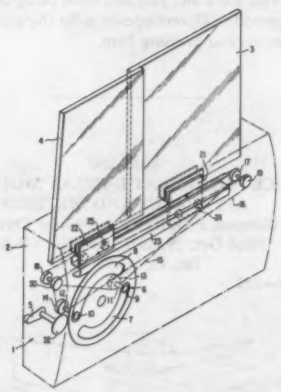
1. A nutrient dispersal device comprising a hollow body section having an upper and lower end and having apertures in sidewalls of the body section, a cap section rotatably connected to the upper end of said body section, said cap section containing at least one aperture of a predetermined diameter to allow liquids entrance into said body section, and a hollow tip section rotatably connected to the lower end of said body section, characterized in that said nutrient dispersal device further comprises a single storage chamber formed from said hollow body section and said hollow tip section, said storage chamber extending from said cap section to a lower end of said hollow tip section, said storage chamber being of uniform diameter from said cap section to the lower end of said hollow tip section, flotation means contained within said single storage chamber for rising in conjunction with the liquid level within said single storage chamber and for sealing said cap aperture at the time the liquid level within said single storage chamber rises to the level of the cap aperture, said flotation means consisting only of a single spherical float being of a diameter less than said uniform diameter and greater than predetermined diameter and arranged to rise in conjunction with said liquid level from the lower end of said tip section to said cap aperture, said tip section being of a first diameter and said body section being of a second diameter, said second diameter being less than said first diameter, whereby said apertures in the sidewalls of the body section are not blocked upon vertical insertion of said nutrient dispersal device into the soil.

4,158,270

DEVICE FOR DRIVING SLIDING WINDOWS

Robert Cherbourg, Rueil; Jean-Pierre Falluel, Pierrelaye, and Michel Menard, Beynes, all of France, assignors to Regie Nationale des Usines Renault, Billancourt, France

Filed Feb. 13, 1978, Ser. No. 877,471
Claims priority, application France, Feb. 11, 1977, 77 03887
Int. Cl.[2] E05F *5/12*
U.S. Cl. 49—103 **5 Claims**



1. An apparatus for driving sliding panels, particularly horizontally sliding windows in an automobile, according to a predetermined operational sequence, said apparatus comprising:

a rotatable crank;

a movable plate rotatably driven about an axis by said crank, said movable plate having a radius and a plurality of concentric grooved sections having different average radii, all of which are smaller than said radius of said movable plate;

a first pinion for each said panel, each said first pinion having an axle;

partial cogs on said grooved sections forming alternate racks intermittently drivingly engagable with each said pinion;

a panel support connected to each said panel; and

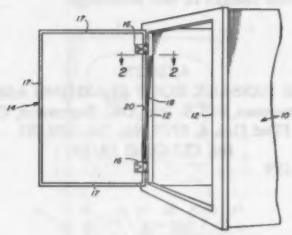
a transmission cable connected to each said first pinion and drivingly engaging each said panel support;

whereby rotation of said crank is transmitted through said movable plate, said pinion, said transmission cable, and said panel support to alternatively drive each said panel.

4,158,271
DOOR CLOSURE

John Barry, Westwood, Mass., assignor to William S. Hawkes, Magnolia, Mass.

Filed Jan. 23, 1978, Ser. No. 871,438
Int. Cl.[2] E05F *1/10*
U.S. Cl. 49—386 6 Claims

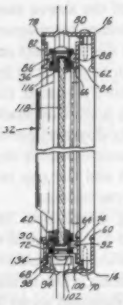


1. A closure device for a door which is hingedly mounted to a door jamb comprising:
- a torsion bar connected at one end at a first location to the door jamb and at its other end, at a second location, to an adjacent portion of the door;
- the distance between said first and second locations, when the door is closed, being less than the length of the torsion bar whereby said bar will be attached in a manner such that when the door is open the bar will extend along a straight line from said first to said second locations, whereby when the door swings toward its closed position, the bar will bow in a direction which will generate a force tending to bias the door toward an open position;
- the bar being installed in a pre-loaded torsion condition which will tend to maintain the door in its closed position when the door is closed,
- said torsional force of the bar and force from the bowing of the bar being directed opposite each other whereby as the door approaches its closed configuration, the progressive bowing of the bar will progressively tend to decelerate the door.

4,158,272
VEHICLE WINDOW WITH NON-REMOVABLE SASH IN CURVED FRAME

Harry M. Riegelman, Fullerton, Calif., assignor to Rusco Industries, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 830,656, Sep. 6, 1977. This application May 2, 1978, Ser. No. 902,042
Int. Cl.[2] E05D *15/16*
U.S. Cl. 49—431 10 Claims



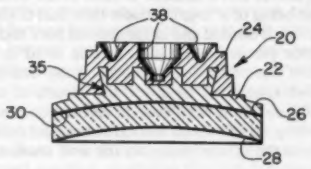
1. In combination:
a frame having spaced straight and curved sections, and end sections connecting the ends of said straight and curved sections,
- each of said sections being a channel with walls each having inner and outer portions connected by a shoulder transition;

a sash having an upper rail extending into said curved section and a lower rail extending into said straight section, and stiles extending between and being connected with said rails;
respective weatherstrip means carried by said upper and lower rails and engaging the outer wall portions of said straight and curved sections;
- and spaced guide and anti-lift elements secured to the bottom of said lower rail,
- each element having vertical sides with respective flanges extending laterially therefrom, said sides being characterized by spring action,
- and said flanges being located between said inner walls with said flanges in interference relation with said shoulder transitions.

4,158,273
METHOD OF BLOCKING PLASTIC LENSES FOR SURFACING

Donald G. Olsen, Riverside, and Nicholas Masi, Providence, both of R.I., assignors to Crown Optical Company, Inc., Greenville, R.I.

Filed Jan. 9, 1978, Ser. No. 868,069
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—284 R 8 Claims



1. A method of grinding a plastic lens, comprising providing a plastic lens blank having a standard convex surface and an opposite surface to be ground, temporarily connecting a stiff, lightweight, disc-like member having a front concave surface shaped to closely conform to the convex surface of said blank and of a peripheral extent substantially equal thereto to said blank by means of a thin adhesive layer so that said surfaces are face-to-face and said member is essentially peripherally coextensive with said blank, said member having an undercut hub upstanding from the central rear surface thereof, and thereafter forming a lens block on the rear central surface of said member by molding a liquid low melting point blocking material directly to and surrounding said hub to form a block thereon whereby said block and said member are integrally joined and wherein heat from said blocking material is absorbed by said member so that said blank is not distorted thereby.

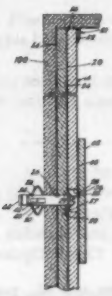
4,158,274
REMOVABLE MIRRORED WALL COVERING

Hector Saenz, 9401 SW. 4 St., Apt. #206, Miami, Fla. 33174

Filed Dec. 22, 1977, Ser. No. 863,329
Int. Cl.[2] G02B *5/08*; E04B *1/38*
U.S. Cl. 52—127 4 Claims

1. In combination, a mirrored wall covering comprising:
- a plurality of mirrored panels to be mounted in side-by-side abutting relation to cover a wall and wall fastener means to fasten the wall panels to a wall, said mirror panels each comprising a plurality of planar mirrors of predetermined size and shape and each having a main reflective surface and an opposite surface coated with reflective material, a backing board for each mirror panel, said backing board having a first and a second opposite main face and each

board being congruent with respect to its associated mirror panel and each of said backing board comprising a rigid load-bearing member, and a coating of adhesive on the opposite mirror surface of each mirror connecting it to the first main surface of its associated backing board, said panels each being sized and configured relative to one another to cover a wall section, and each said panel having a plurality of spaced fastener recesses, each recess being defined by a first bore through the backing board and a second bore aligned with said first bore and of a greater diameter than said first bore and through said



mirror and defining a shoulder at said backing board, and said second bore having a mouth at the reflective surface of said mirror and a fastener in each of the bores and each fastener being of a length greater than that of the first bore and having a headed end in the second bore and a plurality of mirror pieces having a first zone sized to cover the mouth of one of the second bores of the wall section and a second zone sized to cover the mouth of an adjacent second bore of the wall section and an intermediate zone connecting said first and second zones, and cement means to adhere the mirror pieces to the wall section.

4,158,275

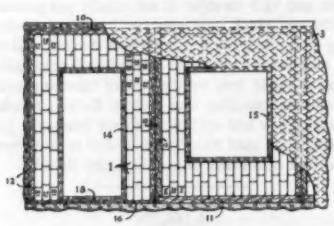
INSULATED WALL AND WALL PART

Alvin E. Moore, 8712 Manini Way, Bay St. Louis, Miss. 39520

Filed Dec. 22, 1977, Ser. No. 863,126

Int. Cl.[2] E04B *1/74*; E04F *13/04*; E04C *1/06*

U.S. Cl. 52—210 **21 Claims**



1. A wall, including a base element, a plurality of can-comprising panels on said base element, each adjacent pair of the panels having panel edges that are juxtaposed to each other, means holding said edges in assembled relation, and wall-finishing material on one side of said panels; each of a plurality of said panels including:

a can-supporting element on the side of said panel opposite from said wall-finishing material;

at least one panel-reinforcing bar, connected to said can-supporting element;

a plurality of layers of cans on said can-supporting element, some of said cans being juxtaposed to said bar, the said cans of each of said layers being in contact with cans of at least one other of said layers; and means, including said bar and said panel-reinforcing network, for holding said cans in assembled relation;

the said wall including: scantlings having some of their ends fixed to ends of said bar; a plate fixed to ends of said scantlings opposite to said ends that are fixed to the bar; flanges on said can-supporting elements; and means connecting said flanges to said scantlings.

4,158,276

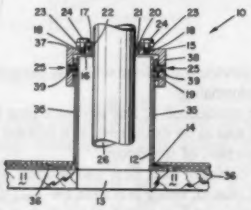
MULTIPLE PASSAGE ROOF FLASHING ASSEMBLY

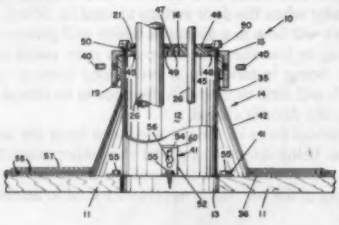
Harold R. Stoneman, 617 S. Isis Ave., Inglewood, Calif. 90301

Filed Oct. 4, 1977, Ser. No. 839,281

Int. Cl.[2] C04D *13/14*

U.S. Cl. 52—219 **27 Claims**





1. An assembly for providing a fluid-sealing passageway for at least one pipe, tube or conduit passed through an opening in the roof of a building, comprising:

(a) sleeve means having a sidewall thereabout and operably disposed about the pipe and having one open end operably alignable with the opening in the roof;

(b) roof flashing means, including a sleeve portion having a rim with an edge thereabout at one end of the sleeve portion and a flanged portion at the other end of the sleeve portion, the sleeve portion being operably disposed about the sleeve means, the length of the sleeve portion being less than the length of the sleeve means;

(c) non-extensible cap means transversely disposed over the other open end of the sleeve means and having at least one aperture therethrough to permit at least one pipe, tube or conduit to be operatively passed therethrough, the cap means further having a skirt depending from the periphery of the transversely disposed portion of the cap means;

(d) first fluid sealing means operably disposed between each pipe, tube or conduit and the cap means about the apertured portion of the cap means;

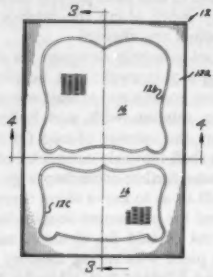
(e) second fluid sealing means operably disposed between the sidewall adjacent to the rim of the other end of the sleeve means, the sidewall adjacent to the rim of the sleeve portion of the roof flashing means and the skirt of the cap means, and sealingly disposed about the edge of the rim of the sleeve portion of the roof flashing means; and

(f) means for retaining the first fluid sealing means between the pipe, tube or conduit and the cap means.

4,158,277
DOOR ARRANGEMENT

Stanley G. Krempp, and David J. Berger, both of Jasper, Ind., assignors to The United Cabinet Corporation, Jasper, Ind.

Continuation of Ser. No. 543,327, Jan. 23, 1975, abandoned. This application Jun. 7, 1976, Ser. No. 693,142
Int. Cl.[2] E06B *3/54*
U.S. Cl. 52—476 1 Claim

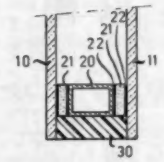


1. A cabinet door arrangement comprising a frame having a front portion and a rear portion, said rear portion adapted to be received within a door opening and said front portion overlying said rear portion and concealing said door opening, said rear portion having a fixed section and a selectively removable section, a channelway defined in said fixed section, said selectively removable section having tongues cooperating with said channelway, an interchangeable cabinet door panel disposed within said channelway in sliding relationship, and fastening means cooperating with said front portion securing said selectively removable section in retaining relationship with respect to said interchangeable cabinet door panel, said front portion of said frame being cut-out to reveal said interchangeable cabinet door panel, and said interchangeable cabinet door panel having a decorative front surface and a decorative rear surface selectively and reversibly revealed through said cut-out in said front portion.

4,158,278
INSULATING GLASS PANE ASSEMBLY

Raffaele Cardinale, Im Hackacker, CH-8902 Urdorf, and Jakob Kuchler, Pappelstrasse 22, CH-8305 Dietlikon, both of Switzerland

Filed Apr. 29, 1977, Ser. No. 792,093
Claims priority, application Switzerland, May 20, 1976, 6324/76
Int. Cl.[2] E06B *5/20;* E04C *2/54*
U.S. Cl. 52—790 2 Claims

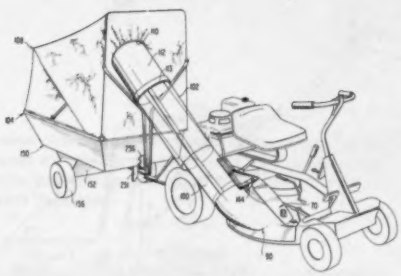


1. An insulating glass pane assembly comprising at least two parallel spaced-apart sheets of glass separated by a crosspiece, a layer of sound-reducing material between said crosspiece and each of said glass sheets, said crosspiece and said layers of sound-reducing material being spaced inwardly from the peripheral edges of said glass sheets to provide an outwardly open channel around the peripheral edges of the glass sheet, the height of said channel being approximately equal to the height of said crosspiece and said layers of sound-reducing material, said open channel being filled with sealing material.

4,158,279
RIDING MOWER WITH GRASS COLLECTING SYSTEM

Harold P. Jackson, McDonough, Ga., assignor to McDonough Power Equipment, Inc., McDonough, Ga.

Filed Apr. 5, 1977, Ser. No. 784,740
Int. Cl.[2] A01D *35/72, 35/12*
U.S. Cl. 56—202 33 Claims



1. A cart assembly for receiving grass clippings, leaves or other similar matter harvested from the ground and discharged by a lawn mower or the like to the rear of which the cart assembly is hitched; the cart assembly comprising, a cart having wheel support means including a transverse axle and two wheels and further having front and rear ends mounted with the wheels located intermediate the front and rear ends in spaced relationship said cart being mounted on said axle for pivoting movement in a vertical plane for purposes of dumping the cart, a canopy defining an enclosure above the cart for receiving harvested matter, means pivotally mounting the canopy to a front end portion of the cart for movement between a closed position overlying the cart for receiving harvested matter and an open position raised from the cart for discharging harvested matter from the cart, and means for pivoting the cart downwardly to the rear about said axis relative to the wheel support means when the canopy is moved to said open position for discharging the contents of the cart and canopy by gravity through the rear of the cart, said last defined means including a strut pivotally connected to the canopy and pivotally connected relative to said wheel support means to cause said cart to be pivoted downwardly about said axle in response to pivoting of the canopy upwardly relative to said cart.

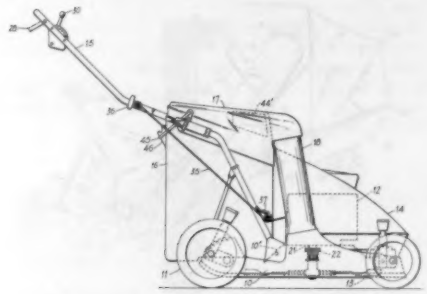
4,158,280
ROTARY LAWN MOWER

George A. Thomas, Des Moines, and Clair D. Splittstoesser, Ankeny, both of Iowa, assignors to AMF Incorporated, White Plains, N.Y.

Filed Jul. 28, 1977, Ser. No. 819,747
Int. Cl.[2] A01D *53/06*
U.S. Cl. 56—202 2 Claims

1. In a rotary lawn mower, a mower deck, said deck having a transverse dimension and a longitudinal dimension, said longitudinal dimension extending in the direction of travel of said mower and being about double said transverse dimension, said deck being generally rectangular shaped in top plan view, a ground engaging wheel mounted at each corner of said rectangular shaped deck for moving said mower in either direction of said longitudinal dimension, a grass cutting blade positioned beneath said deck, a power unit mounted on the top of said deck for driving said blade, said power unit being centrally positioned on said deck proximately at the rear portion of the forward half of said deck, a generally U-shaped handle mounted to the rear half of said deck, said handle ex-

tending rearwardly from said mower at an angle of approximately 45 degress, a receptacle cover mounted to said handle, said cover being vertically spaced above the rear half of said deck, said cover being generally square in top plan view, an inlet opening formed in one corner of said generally square cover at one side of said mower, a discharge opening formed in the top of said deck at the same side of said mower as said inlet opening, a generally vertical tube extending from said discharge opening to said inlet opening for conveying grass cut by said blade beneath said deck up through said discharge opening and then through said inlet opening to up against the



underside of said cover, a grass catching generally square shaped box being directly positioned on the rear half of said deck behind said power unit and between opposite sides of said handle and opposite rear wheels of said mower and directly beneath said cover, said box being open at the top and directly slidable on said mower deck in drawer-like fashion in either direction of said longitudinal dimension whereby in the mounted position of said box on said mower said open top is closed by said cover, latch means for locking said box in cover closed position, and said box being entirely removable from said mower upon disengagement of said latch means for emptying the contents of said box.

4,158,281

SPLICING TOOL

Frank L. Morang, St. Petersburg, Fla., assignor to Harman Wheeler and M.W.W., Inc., both of St. Petersburg, Fla.; part interest to each

Filed Jun. 30, 1975, Ser. No. 591,514

The portion of the term of this patent subsequent to Feb. 19, 1994, has been disclaimed.

Int. Cl.[2] B65H *69/06*

U.S. Cl. 57—23 **6 Claims**

1. A splicing tool primarily designed for splicing rope portions, said splicing tool comprising: a fid element including a substantially hollow portion and at least one open end disposed in communicating relation with said hollow portion, plug means mounted on the interior of said fid element, grasping means including a shaft movably connected to said plug means, said grasping means further including a grasp element connected to said shaft so as to move along therewith, said grasping means disposed for movement longitudinally of said plug means into and out of said fid element, said grasp element comprising a one piece wire spring member structurally configured to comprise inherent bias, whereby movement of said grasp element into and out of said fid element causes relative movement of corresponding portions of said wire spring member towards and away from one another respectively, gripping teeth means defined by the extremities of said wire spring member, said gripping teeth means defined by projections, whereby said gripping teeth projections serve to penetrate a rope portion being spliced; said plug means comprising a channel formed therein and including a reduced diameter relative to that of said fid element, said shaft being disposed in sliding engagement within said channel for both relative longitudinal and rotational movement therein, said shaft further comprising a head portion configured to extend outwardly from the longitudinal axis of said shaft, said channel configured for sliding engagement relative to said head portion therein, whereby said head portion may move along the interior of said channel along the longitudinal axis thereof.

2. A splicing tool primarily designed for splicing rope portions, said splicing tool comprising: a fid element including a substantially hollow portion and at least one open end disposed in communicating relation with said hollow portion, plug means mounted on the interior of said fid element, grasping means including a shaft movably connected to said plug means, said grasping means further including a grasp element connected to said shaft so as to move along therewith, said grasping means disposed for movement longitudinally of said plug means into and out of said fid element, said grasp element comprising a one piece wire spring member structurally configured to comprise inherent bias, whereby movement of said grasp element into and out of said fid element causes relative movement of corresponding portions of said wire spring member towards and away from one another respectively, gripping teeth means defined by perpendicular bends proximate the extremities of said wire spring member, said gripping teeth means extending substantially perpendicular to the longitudinal axis of said fid element whereby said gripping teeth projections serve to penetrate a rope portion being spliced; said plug means comprising a channel formed therein, said channel including a reduced diameter relative to that of said fid element, said shaft movably being mounted within said channel and disposed for movement in both a longitudinal and rotational direction relative to the longitudinal axis of said plug means; said shaft being disposed in threaded engagement within said channel for both longitudinal and rotational movement within said fid element.

4,158,282

TWISTER MECHANISM WITH ELASTIC PART

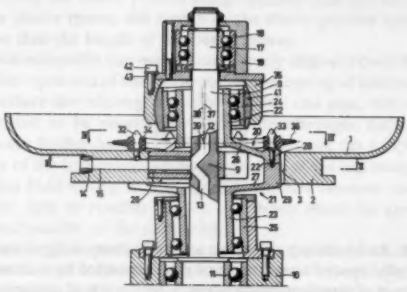
Jean-Pierre Guerton, Maisons Alfort; Jean Waleckx, Villebon sur Yvette, and Jean-Michel Monville, Paris, all of France, assignors to SKF Compagnie d'Applications Mecaniques, Clamart, France

Filed Mar. 1, 1978, Ser. No. 882,513

Claims priority, application France, Mar. 4, 1977, 77 06419; Feb. 15, 1978, 78 04321

Int. Cl.[2] D01H *7/86*

U.S. Cl. 57—58.72 **11 Claims**



1. A twister mechanism, comprising,

a first revolving assembly including a spindle rotatable about a spindle axis, a second revolving assembly including a sleeve located in spaced relation around said spindle, said

second revolving assembly being supported for rotational movement about a second axis which is oblique with respect to the spindle axis, elastic means connecting said first and second assemblies together for concurrent rotation,

a spool carrier, a bearing connecting said spool carrier to said first revolving assembly, and a bearing connecting said spool carrier to said second revolving assembly to prevent rotation of said spool carrier,

said first revolving assembly having portions which extend radially through said second revolving assembly and are separated by indentations, said second revolving assembly having circumferentially spaced sectors with portions which extend into said indentations, a first set of circumferentially spaced fastening means on said first assembly at a location radially outside said sleeve, a second set of circumferentially spaced fastening means on said second assembly externally of said sleeve, said elastic means connecting said first set and said second sets of fastening means.

4,158,283

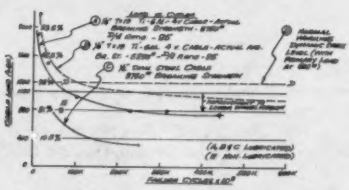
CABLE STRESS AND FATIGUE CONTROL

Milton A. Nation, 905 Moraga Dr., Los Angeles, Calif. 90049

Filed Jan. 5, 1977, Ser. No. 757,300

Int. Cl.[2] D07B *5/00*

U.S. Cl. 57—200 **11 Claims**



1. A cable made of a plurality of titanium (ti) wires having an elastic modulus of about 12×10^6 psi, and a spring constant inversely proportional to said modulus, being stranded and layered in helices, said cable having high capacity for work at maximum loads in helices, said cable having high capacity for work at maximum loads of 30% of breaking strength, and said wires being separable and resistant to strainhardening under pressure and workload, wherein:

efficiency of said cable is between 88% and 95%, linear loading is not less than 80% of breaking strength having balanced dynamic, mechanical and physical properties to said level, and wherein:

said wires having versatile strength including high strength-to-weight ratio in excess of 11×10^5, high torsional strength in helices in excess of 80 torsions at a density of 0.16 lbs. per cu. in., and high linear strength in excess of 85% of ultimate breaking strength in said cable, and having high drop tear test energy in excess of 750 ft. lbs., whereby

said cable limits stresses induced, and fatigue flaws do not occur.

4,158,284

YARN QUALITY MONITORING APPARATUS

Heinz Webde, Rothenberg, Fed. Rep. of Germany, assignor to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

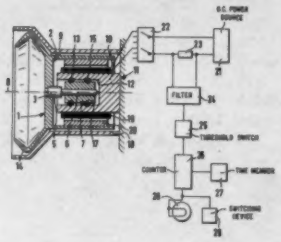
Filed Dec. 22, 1977, Ser. No. 863,156

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658477

Int. Cl.[2] D01H *1/12, 13/14, 13/22*

U.S. Cl. 57—265 **7 Claims**

1. In apparatus for monitoring yarn being produced in an open-end spinning turbine provided with its own electric drive motor, which apparatus includes means for detecting spinning condition variations which cause irregularities and/or changes in structure in the yarn and an evaluation circuit providing an indication upon the occurrence of such irregularity, the improvement wherein said detecting means comprises a sensor connected for sensing changes in the current consumption of the drive motor indicative of the occurrence of such spinning condition variations.



4,158,285

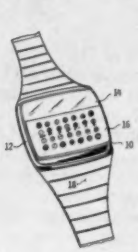
INTERACTIVE WRISTWATCH CALCULATOR

Edward A. Heinsen, Cupertino; Andre F. Marion, Palo Alto, and Thomas E. Osborne, San Francisco, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 9, 1976, Ser. No. 656,751

Int. Cl.[2] G04C *3/00*; G06F *7/38*

U.S. Cl. 58—23 R **66 Claims**



1. A watch/calculator comprising:

a keyboard including numerical keys and arithmetic function keys;

calculator circuit means connected to the keyboard for accepting numerical entries from the keyboard and for performing arithmetic operations on numerical data in response to actuation of arithmetic function keys on the keyboard;

display means connected to the calculator circuit means for displaying numerical data;

watch circuit means connected to the calculator circuit means and the display means for storing and periodically updating data representing time; and

a time entry delimiter key on the keyboard for delimiting the entry of portions of time information from the keyboard where each portion has a different unit and for causing the display of a selected character on the display means between adjacent portions of entered time information when the time entry delimiter key is depressed, wherein the time entry delimiter key is depressed after the entry of a first predetermined number of digits from the keyboard to indicate entry of time information having a first unit by causing the display of a selected character after the first predetermined number of digits and to enable entry of time information having a second unit, and the time entry delimiter key is again depressed after the entry of a second predetermined number of digits from the keyboard to

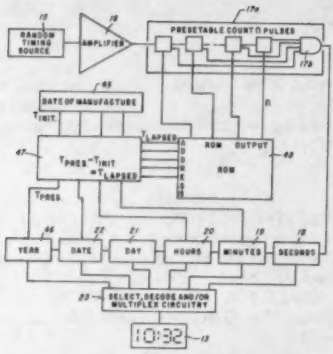
indicate entry of time information having the second unit by causing the display of a selected character after the second predetermined number of digits and to enable entry of time information having a third unit.

4,158,286

HOROLOGIC INSTRUMENTS WITH RANDOM TIMING SOURCE

Alan R. Reinberg, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 6, 1976, Ser. No. 702,798
Int. Cl.[2] G04C 3/00
U.S. Cl. 58—23 C **18 Claims**



1. An electronic timekeeping apparatus comprised of:

a. a random energy generator which is of sufficient accuracy over the long term to provide a timekeeping reference, said generator including:

(i) a radioactive energy source, and

(ii) detector means for detecting energy generated by said radioactive source and producing electronic signals in synchronism therewith;

b. electronic counter means coupled to the detector means of said generator for counting said electronic signals and for generating a timing signal each time a preselected count is reached;

c. timekeeping circuitry coupled to said counter means, said timekeeping circuitry being stepped by one unit of time for each timing signal generated by said counter means; and

d. compensation circuitry for compensating for changes in pulse rate due to radioactive decay of said radioactive energy source.

4,158,287

DRIVER CIRCUIT FOR ELECTRO-MECHANICAL TRANSDUCER

Fumio Nakajima, Tokyo; Takayasu Machida, Iruma, and Kenji Yamada, Koganei, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

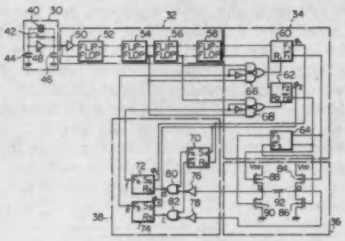
Filed Aug. 3, 1977, Ser. No. 821,433
Claims priority, application Japan, Aug. 12, 1976, 51-96405; Jan. 13, 1977, 52-2679
Int. Cl.[2] G04C 3/00
U.S. Cl. 58—23 BA **7 Claims**

1. A driver circuit for an electro-mechanical transducer of an electronic timepiece having an oscillator circuit providing a relatively high frequency signal and a frequency divider to divide down the relatively high frequency signal to provide a low frequency signal, said driver circuit comprising:

a driving coil for driving said electro-mechanical transducer;

means for detecting an induced voltage of said driving coil and producing an output signal when said induced voltage decreases below a predetermined value; and

a pulse width change-over circuit connected to said frequency divider and responsive to said low frequency signal to provide first driving pulses of a first pulse width to energize said driving coil when said induced voltage is above said predetermined value;



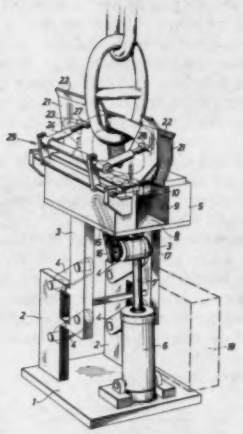
said pulse width change-over circuit including means for providing second driving pulses of a second pulse width larger than said first pulse width to energize said driving coil in response to said output signal to compensate for a decrease in said induced voltage below said predetermined value.

4,158,288

REVOLVING CHAIN LINKS

Rolf Bergström, Ramnäs, Sweden, assignor to Bulten-Kanthal AB, Hallstahamar, Sweden

Filed Dec. 23, 1977, Ser. No. 864,039
Claims priority, application Sweden, Dec. 30, 1976, 7614748
Int. Cl.[2] B21L 19/00
U.S. Cl. 59—1 **16 Claims**



1. A method of revolving the last chain link element of a free hanging chain end, comprising the steps of

(a) bringing said element into contact with a driving roller means located under said chain end by relative vertical movement between said element and said driving roller means;

(b) rotating said element in its own substantially vertical plane through frictional contact with said driving roller means, said driving roller means supporting said element during such rotation; and

(c) terminating said contact upon completion of said rotating

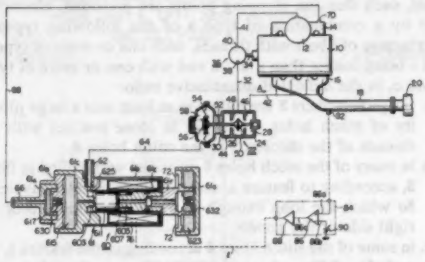
movement by relative vertical movement between said element and said driving roller means.

4,158,289

ELECTROMAGNETIC VACUUM SWITCHING VALVE FOR USE IN AN EXHAUST GAS CLEANING APPARATUS

Minoru Iwata, Susono; Takeru Yasuda, Nagoya, and Shyoichi Hagiwara, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Industry Co., Ltd., Obu, both of, Japan

Filed Sep. 26, 1977, Ser. No. 836,726
Claims priority, application Japan, Jul. 5, 1977, 52-79474
Int. Cl.[2] F01N *3/15*
U.S. Cl. 60—276 **3 Claims**



1. A vacuum switching valve of an electromagnetic type adapted for use in an exhaust gas cleaning apparatus of an internal combustion engine for selectively introducing a vacuum signal from an intake system of the engine into the apparatus, said vacuum switching valve comprising:

a body provided with a first valve seat and a second valve seat, said body forming a first passageway adapted for connecting said first valve seat with an engine vacuum port formed in said intake system of said engine, and forming a second passageway adapted for connecting said second valve seat with an atmosphere;

a common port adapted for connecting a space formed in said body between said first valve seat and said second valve seat with said exhaust gas cleaning apparatus;

a valve member located between said first valve seat and said second valve seat;

a solenoid coil cooperable with said valve member in such a manner that said valve member in switched between a first position in which said valve member rests on said second valve seat and a second position in which said valve member rests on said first valve seat;

a first orifice disposed in said first passageway for controlling the speed of transmitting a vacuum signal from said engine port into said first valve seat; and

a second orifice disposed in said second passageway for controlling the speed of transmitting an atmospheric air pressure signal from the atmosphere into said second valve seat.

4,158,290

ELECTRO-HYDRAULIC CONTROLLER

Charles R. Cornell, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 795,689, May 11, 1977, Pat. No. 4,091,617. This application May 24, 1978, Ser. No. 909,138
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—445 **14 Claims**

1. A control system for a hydrostatic transmission including a fluid pump and a fluid motor, said fluid pump having fluid operable means for varying the displacement thereof, and a source of pressurized fluid for operating the fluid operable means, said control system comprising:

(a) a housing defining a valve bore, an inlet fluid port adapted for series fluid communication with the source of pressurized fluid, a control fluid port adapted for series fluid communication with the fluid operable means, and a drain fluid port adapted for communication with a fluid drian, said ports being in fluid communication with said valve bore;

(b) valve means disposed in said valve bore and movable between a first position permitting fluid communication between said inlet fluid port and said control fluid port and a second position;

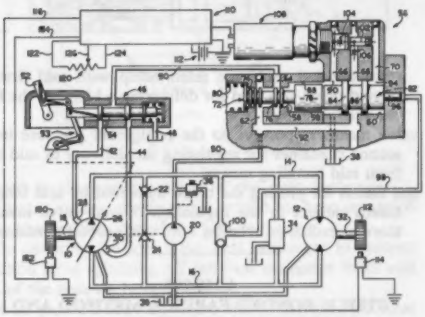
(c) first means for biasing said valve means toward said first position;

(d) second means for biasing said valve means toward said second position;

(e) one of said first and second biasing means including:

(1) means for generating a variable electrical command signal P; and

(2) means responsive to said variable electrical command



signal P to provide a variable biasing force, biasing said valve means toward said respective position, said variable biasing force being related to said variable electrical command signal P in a known manner;

(f) said means for generating said command signal P including:

(1) input command signal generator means which is variable to correspond to a maximum desired input to the transmission;

(2) means providing an electrical signal N_m representative of the output speed of the fluid motor, said maximum desired input being proportional to the product of P and N_m;

(3) means providing an electrical input approximation signal representative of the product of the speed N_m of the fluid motor and the instantaneous command signal P; and

(4) means for comparing said input command signal and said input approximation signal and generating a new command signal P tending to minimize the difference between said input command signal and said input approximation signal.

4,158,291

ENVIRONMENTALLY ASSISTED HEATING AND COOLING SYSTEM

John W. Jones, Dayton, Ohio, assignor to SunTerra Corporation, Dayton, Ohio

Filed Jun. 20, 1977, Ser. No. 807,987
Int. Cl.[2] F01K *25/10*; F03G *7/02, 7/00*
U.S. Cl. 60—641 **19 Claims**

1. Apparatus for conditioning the air within a building or the like comprising:

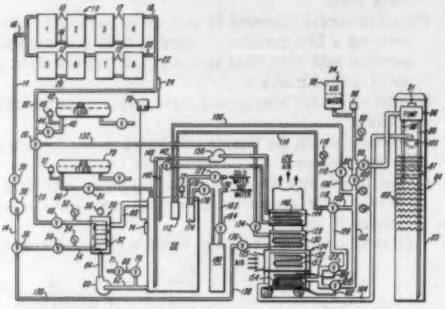
a heat engine having a first refrigerant container for heat

exchange with building air and a second refrigerant container, said heat engine operable to cause refrigerant condensation in one of said containers and refrigerant evaporation in the other of said containers,

a first fluid reservoir having a first temperature,

a second fluid reservoir generally having a second temperature,

blending means for receiving fluids derived respectively



from thermal exchange relationship with said first and second reservoirs, and for delivering a blend of the fluids received thereby,

valve means responsive to the refrigerant pressure in said second container for regulating the delivery of said blend from said blending means,

and means for placing the blend delivered by said blending means subject to the regulation of said valve means in thermal exchange relation with said second container.

4,158,292

STITCH BONDED FABRICS, METHOD AND APPARATUS FOR MAKING THE SAME

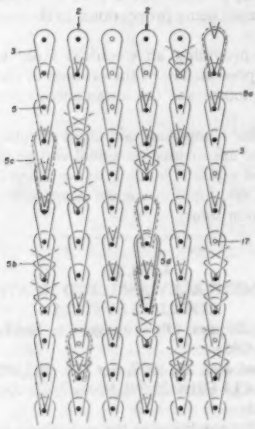
Gustav Ehedy, Augustusburg; Heinz Kemter, Karl Marx Stadt; Wilfried Ponitz, Plauen; Engelbert Ehrlich, Flöha; Walter Politze, Karl Marx Stadt; Walter Scholtis, Karl Marx Stadt, and Wolfgang Wunsch, Karl Marx Stadt, all of German Democratic Rep., assignors to VEB Wirkmaschinenbau Karl-Marx-Stadt, Karl Marx Stadt, German Democratic Rep.

Filed Aug. 10, 1977, Ser. No. 823,361

Claims priority, application German Democratic Rep., Aug. 17, 1976, 194356

Int. Cl.[2] D04B *7/12, 7/14, 9/14*

U.S. Cl. 66—190 **15 Claims**



1. Warp knitted fabrics, particularly stitch bonded fabrics, consisting of a fleece, preferably a fiber fleece, which is reinforced by means of a plurality of parallel rows of single thread stitches sewn into said fleece by the action of slide needles piercing the same, and which rows of stitches extend in a longitudinal direction, and in which some of the stitch holes are empty of pulled fleece fibers and in which there are fibers or parts of fibers of the fleece situated in some of the stitch holes, which fibers or parts of fibers have been pulled into the hole by the action of slide needles within the fleece and which fibers or parts of fibers have different lengths, the fleece structure being substantially unimpaired because of the variable frequency of the amount and length of said fibers or parts of fibers resulting from dissimilar groupings of fibers in the fleece structure, and whereby the stitches having fibers or parts of fibers pulled in are insensitive with respect to a ripping out of the threads and to the formation of runs and whereby runs or the ripping open of rows of stitches is stopped at normal thread loads, such that run stopping points are provided, characterized by a combination of type a of the following types of interlacings of fibers with threads, with one or more of types d and e being longer than a stitch and with one or more of types b and c, in the indicated quantitative ratio:

a. the pulled fibers 5 are pulled in at least into a large plurality of stitch holes 4 and are in close contact with the threads of the stitches 3 in the stitch holes 4;

b. in many of the stitch holes 4 provided with pulled in fibers 5, according to feature a, some of these fibers 5 have ends 5*a* which are long enough to be in the stitches 3 of the right side of the goods;

c. in some of the stitch holes 4 according to the feature a, the ends 5*b* of fibers 5 are somewhat longer than the others and interlace loosely into the stitches 3 of the right side of the goods;

d. in some of the stitch holes 4, according to feature a, the fibers 5 have such a length that they are interlaced in a stitch like fashion with the stitches 3 of the right side of the goods and are formed as stitch like interlacings 5*c*;

e. in some of the stitch holes 4, according to feature a, the fibers 5 form stitch like fiber hooks 5*d*, through the upper part of which one stitch 3, each of the right side of the goods, is pulled;

f. the quantity of the interlacing type 5*b* is smaller than that of 5*a* and the quantities of the types 5*b* to 5*d* decrease in that sequence.

4,158,293

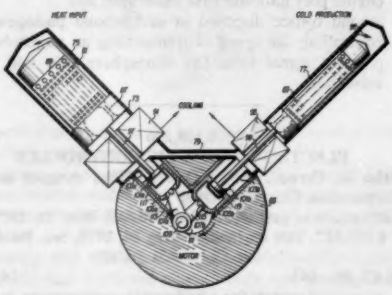
REFRIGERATION SYSTEM WITH MAGNETIC LINKAGE

Fred F. Chellis, Concord, Mass., assignor to Cryogenic Technology, Inc., Waltham, Mass.

Division of Ser. No. 665,848, Mar. 17, 1976, Pat. No. 4,118,943. This application Dec. 12, 1977, Ser. No. 860,018

Int. Cl.[2] F25B *9/00*

U.S. Cl. 62—6 **1 Claim**



1. The method of moving a displacer in a refrigeration appa-

ratus mounted in an elongated sealed cylinder, along the elongated sealed cylinder, comprising the steps of:

mounting a magnetic-material follower on the displacer inside the elongated sealed cylinder attached to the displacer for movement therewith;

attracting the magnet-material follower with a magnetic-material driver located outside of the said working cylinder; and

moving said magnetic-material driver along said cylinder to thereby move said magnetic-material follower and the attached displacer along said cylinder.

4,158,294

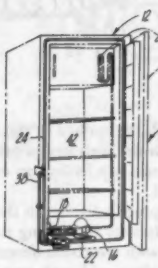
REFRIGERATOR HAVING CABINET WARMING HEAT TRANSFER DEVICE

K. Bailey Keeling, Jr., Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 1, 1977, Ser. No. 856,374

Int. Cl.[2] F25B *47/00*

U.S. Cl. 62—277 **14 Claims**



1. In a refrigerator comprised of a refrigerator cabinet defining an enclosed space, a door providing access to said interior space and means for refrigerating said enclosed space, the combination including:

a heat source;

heat transfer means transferring heat from said heat source to portions of said refrigerator cabinet;

selectively operable control means interrupting said transfer of heat from said heat source to said refrigerator cabinet portions by said heat transfer means, said control means including a movable control member and means mounting said control member to be manually moved to differing positions independently of the position of said refrigerator door, said control means including means establishing said transfer of heat upon movement of said control member to one position, and also including means causing said interruption of said transfer of heat from said heat source in response to positioning of said control member in another position by said manual movement of said control member, whereby the heating of said portions of said refrigerator cabinet by said heat transfer means may be controlled by moving said control member independently of said door position.

4,158,295

SPRAY GENERATORS FOR ABSORPTION REFRIGERATION SYSTEMS

Howard W. Sibley, Baldwinsville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,554

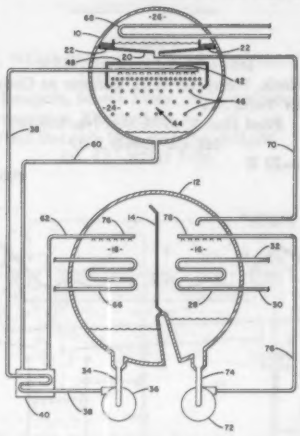
Int. Cl.[2] F25B *15/00, 33/00*; F22B *1/02*

U.S. Cl. 62—476 **8 Claims**

1. In an absorption refrigeration system, wherein a solution of refrigerant and absorbent fluid is heated to separate refrigerant from the solution leaving concentrated absorbent fluid, a generator for heating the solution, including,

a spray nozzle to spray the solution of refrigerant and absorbent fluid downward,

a heat exchanger positioned below the spray nozzle and comprised of a bundle of substantially parallel, generally horizontal heat exchange tubes, wherein the tubes are closely spaced in the top portion of the heat exchanger to retard the flow of solution therethrough and aid sensible heating of the solution, and wherein the tubes are widely



spaced in the lower portion of the heat exchanger to facilitate the flow of refrigerant, which has been separated from the solution, out of the heat exchanger,

a baffle covering the top of the heat exchanger to prevent solution from splashing off the heat exchange tubes and out of the heat exchanger, and

means to pass a relatively warm fluid through each heat exchange tube for transmitting heat to the solution to separate refrigerant from the solution.

4,158,296

HAND-KNITTING METHOD

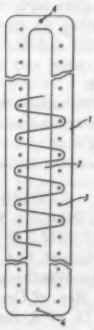
Thomas A. Dunlop, 16 N. Park Ave., Girvan, Ayrshire, KA26 9AH, England

Filed Apr. 28, 1977, Ser. No. 791,728

Claims priority, application United Kingdom, May 4, 1976, 18108/76

Int. Cl.[2] D04B *3/00*

U.S. Cl. 66—4 **3 Claims**



1. A method of producing a flat-knitted article with finished edges comprising the steps of winding a first row of a yarn around the pins of a board, said board including a longitudinal slot; a plurality of said pins secured to said board and equi-

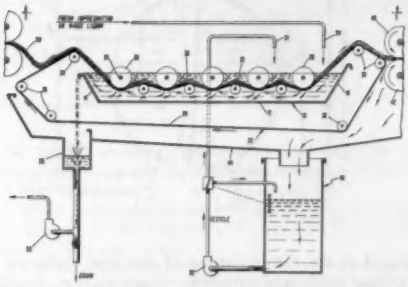
spaced along both sides of said slot; and additional pins one at each of the ends of said slots; each said additional pin on the centerline of said slot, winding said yarn around one of said additional pins, then winding said yarn in the direction of said other additional pin, and after said yarn is wound over an existing winding of yarn, lifting said existing winding of yarn over each said pin leaving a winding of yarn wound around each pin, and repeating said winding and lifting until an optional size article has been knitted.

4,158,297

IMPREGNATOR/RINSER

Allen R. Winch, Westfield, N.J., assignor to Cotton, Incorporated, New York, N.Y.

Filed Dec. 9, 1977, Ser. No. 859,167
Int. Cl.² D06B *3/02*
U.S. Cl. 68—22 R **20 Claims**



1. An apparatus for impregnating a moving non-woven fiber batt with fluid by intermittently squeezing the batt, comprising:

a longitudinal tank provided with fluid and having first and second ends;

an endless conveyor belt arranged for travel within the fluid of the tank between the first and second ends of the tank in a generally longitudinal direction, the belt carrying the fiber batt through the tank with the batt always located on an upper surface of the belt;

a series of squeeze rollers arranged within the longitudinal tank, the endless conveyor belt carrying the batt between the belt and each squeeze roller to define a nip between each of the squeeze rollers and the endless conveyor belt to thereby expel fluid from the batt;

a series of singular rollers arranged within the longitudinal tank, with an uppermost portion of each singular roller being vertically above and between lowermost portions of adjacent squeeze rollers with

the endless belt traveling on each singular roller with the belt between the batt and the singular roller to thereby allow the batt to expand and absorb fluid between adjacent squeeze rollers;

whereby the batt is alternately squeezed to expel fluid and then allowed to expand to absorb fluid while being carried through the tank of fluid.

4,158,298

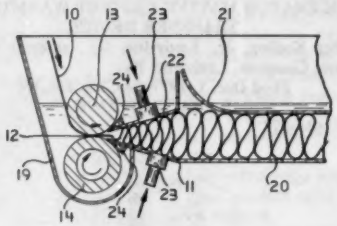
DEVICE FOR CONTINUOUS WET TREATMENT OF TEXTILE WEBS

Gerhard W. Bühre, Bendestorf, Fed. Rep. of Germany, assignor to Artos Dr.-Ing. Meier-Windhorst KG (GmbH & Co.), Hittfelder Kirchweg, Fed. Rep. of Germany

Filed Feb. 13, 1978, Ser. No. 877,458
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705761
Int. Cl.² D06B *3/10*
U.S. Cl. 68—43 **8 Claims**

1. In a device for the continuous treatment of relatively wide textile webs in a treatment medium of the type including a trough having a top open end in which is received a treatment medium and which has squeezing elements associated therewith for intensifying the treatment of the web with the treatment medium and a substantially horizontally oriented funnel-shaped diffusor disposed adjacent to an entrance end of the trough for guiding the web into the trough wherein the web travels in generally the same direction through the trough as the treatment medium in a generally sinuous serpentine independent manner, the improvement comprising:

squeezing means disposed adjacent to said diffuser including a pair of coacting substantially vertically arranged rotatable squeeze rollers which define therebetween a squeezing nip disposed within the trough below the top open end



thereof and beneath the surface of the treatment medium and through which the web passes prior to introduction into said diffuser, said nip having an entrance side and a discharge side; and

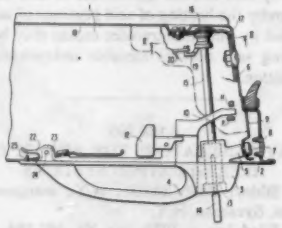
deflection means disposed adjacent to the discharge side of said nip of said rollers for facilitating removal of said web from engagement with the circumferential surface of said rollers and for guiding said web into said diffuser, said diffuser being disposed substantially beneath said surface of the treatment medium and suitably dimensioned and configured to permit the continuous generation of transverse, sinuous, pleated fold portions in the web which fold portions expand in width as they pass through said diffuser.

4,158,299

DOOR LOCK FOR MOTOR VEHICLES

Christian Grabner, Gechingen; Rolf Krügener, and Hermann W. Kurth, both of Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 1, 1978, Ser. No. 901,776
Claims priority, application Fed. Rep. of Germany, May 7, 1977, 2720713
Int. Cl.² E05B *13/10*
U.S. Cl. 70—224 **18 Claims**



1. A door lock for motor vehicles, comprising a lock cylinder means which is operatively connected by way of an insertable entrainment rod means with a lock tumbler means arranged in the door and with locking linkage means, said lock cylinder means being inserted together with a door handle into

an aperture provided therefor in an outer body panel of the door, characterized in that an anti-theft means is operatively connected with the lock cylinder means, said anti-theft means engaging a locking means provided at the door from behind.

4,158,300

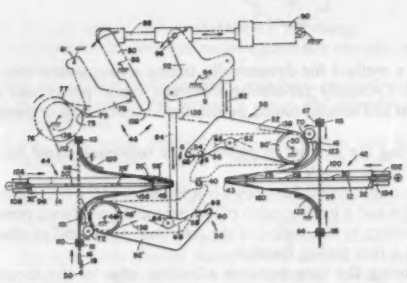
APPARATUS FOR PRODUCING A SPIRALLY WOUND ELECTROCHEMICAL CELL

Leonard F. Hug, Wheatridge; Donald H. McClelland, Littleton, and Toshio Uba, Denver, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 861,157, Dec. 16, 1977, Pat. No. 4,099,401, which is a division of Ser. No. 810,336, Jun. 27, 1977, Pat. No. 4,112,202, which is a division of Ser. No. 733,674, Oct. 18, 1976, Pat. No. 4,064,725. This application May 17, 1978, Ser. No. 906,793

Int. Cl.² B21C *47/04*

U.S. Cl. 72—148 **8 Claims**



1. A generally cylindrical mandrel for facilitating the spiral winding of an electrochemical cell pack comprising electrode plates and interleaved separators, comprising: a pair of oppositely disposed, notched lands which extend inwardly from the peripheral surface of the mandrel for receiving leading edges of the cell pack to be wound, and a pair of major edge surfaces extending from the lands about a major portion of the periphery of the mandrel, the edge surface defined by a generally spiralled curvature.

4,158,301

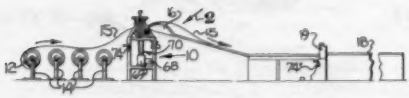
METHOD AND APPARATUS FOR DECOILING SHEET MATERIAL

Jack C. Smith, Box 724, Kernersville, N.C. 27284

Filed Sep. 26, 1977, Ser. No. 836,352

Int. Cl.² B21D *3/02*

U.S. Cl. 72—183 **16 Claims**



1. A method for removing the coil set from a coiled roll of sheet metal material or the like and characterized by intermittently stopping the advance of the sheet material to permit the cutting or other processing thereof and without imparting a crease in the material, and comprising the steps of

advancing the sheet material along a predetermined path of travel while applying a reverse bending force to the sheet material sufficient to remove the coil set therefrom as the sheet material passes a fixed location along the path of travel,

terminating the advance of the sheet material and substantially concurrently releasing the application of the reverse bending force, and then

re-establishing the advance of the sheet material and substantially concurrently re-establishing the application of the reverse bending force, and including initially reversely advancing the sheet material such that the point on the sheet material at which the force was released when the advance was terminated is brought to a position upstream of the location at which the bending force is applied, to thereby insure that the reverse bending force is applied to all portions of the sheet material.

4,158,302

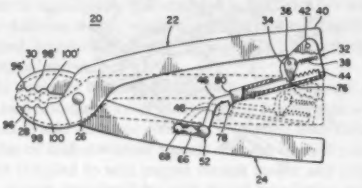
TOOL WITH FULL-STROKE COMPELLING MECHANISM

Francis A. O'Loughlin, Scotch Plains, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Dec. 23, 1977, Ser. No. 863,686

Int. Cl.² B21D *7/06*

U.S. Cl. 72—409 **10 Claims**



1. In a tool of the type having first and second pivotally coupled handle members each coupled to a respective jaw member for applying a compressive force between said jaw members, and including a full-stroke compelling mechanism coupled between said handle members wherein said mechanism includes a housing pivotally coupled to said first handle members, ratchet means coupled to said second handle member and having a toothed end portion linearly movable within said housing, and pawl means in said housing for selective engagement with said toothed end portion of said ratchet means, the improvement comprising: means for selectively repositioning the coupling between said full-stroke compelling mechanism and at least one of said first and said second handle members along the longitudinal axis of said at least one of said first and said second handle members.

4,158,303

FRAME AND BODY STRAIGHTENING EQUIPMENT

Cyrill Horn, and Wayne J. Horn, both of Rte. 5, Box 49, Corinth, Miss. 38834

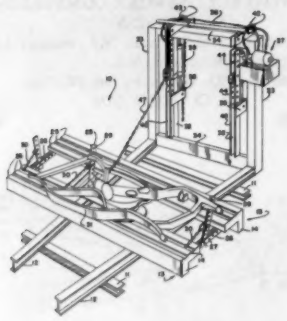
Continuation of Ser. No. 642,200, Dec. 18, 1975, abandoned. This application Sep. 26, 1977, Ser. No. 836,797

Int. Cl.² B21D *1/14*

U.S. Cl. 72—457 **3 Claims**

1. A frame and body straightening apparatus comprising a vehicle supporting framework, said framework thereagainst a pair of spaced apart horizontally extending beams secured to a pair of transversely extending beams forming a base for the said framework, a rotatable drum positioned between said base and said horizontally spaced apart beams, a pair of parallely spaced apart channel irons secured to said drum for rotation therewith, transfer beams extending between said spaced apart channel irons and being adjustably secured thereto, brace arms adjustably secured to said transfer beams adapted to engage with a portion of a vehicle body positioned on said framework and to retain the same thereon when a pulling force is applied there against to effect a straightening of a bent portion of a vehicle frame, a tower fixedly mounted at one end of said horizontally extending beams, said tower comprising upper and lower horizontally extending beams and vertically disposed beams said horizontally extending beams of the tower and said vertically disposed beams of the tower are fixed to one another and to said horizontally extending beams secured to

said base to form a rigid unit, a laterally adjustable vertical standard mounted on said tower, a plurality of spaced apart tabs provided on said upper and lower horizontally extending beams of said tower, said vertical standard including a first pair of spaced apart roller carrying plates and a power cylinder, a power source secured to said cylinder, a first roller means mounted at the upper portion of said vertical standard between said spaced apart roller carrying plates, a second roller means adjustably mounted between a second set of spaced apart roller carrying plates fixed to the said standard, a tie means, one end



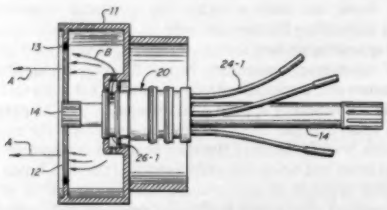
of said tie means secured to said cylinder and trained to travel over the said first roller means and under the second roller means, the other end of said tie means engaging a portion of said vehicle body to be straightened, said vertical standard nesting between said spaced apart tabs on said upper and lower horizontally extending beams of the said tower to prevent lateral movement of the said standard when said cylinder is actuated to exert a pulling force on a portion of said vehicle body to effect a straightening of a bent portion of said vehicle body mounted on said framework.

4,158,304

TESTING OF FLUIDIC DEVICES

John Ceramicoli, 211 Beaver St., Framingham, Mass. 01701

Filed Sep. 26, 1977, Ser. No. 836,540
Int. Cl.[2] G01M *19/00*
U.S. Cl. 73—49.8 9 Claims



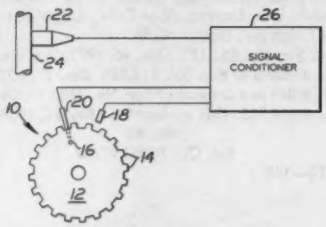
1. The method of testing fluidic devices which comprises applying an interface adapter to the device, said adapter including an internal channel that extends to a port which is able to communicate with a corresponding part of the device and is located in a groove bounded by snap rings; and directing a gaseous medium into said device through said internal channel.

4,158,305

METHOD FOR DYNAMICALLY TIMING AN APPARATUS

William W. Shipley, East Peoria, Ill., assignor to Caterpilla Tractor Co., Peoria, Ill.

Filed Mar. 31, 1978, Ser. No. 892,447
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—119 A 6 Claims



1. In a method for dynamically timing an apparatus which includes cyclically generating reference signal pulses and at least first and second timing pulses, the improvement comprising:

counting the number of pulses of the reference signal for a generating cycle;

measuring the time between a leading edge of the first timing pulse and a leading edge of the preceding reference pulse, dividing by the period of the reference pulse, and producing a first timing fraction;

measuring the time between a leading edge of the second timing pulse and a leading edge of the preceding reference pulse, dividing by the period of the reference pulse, and producing a second timing fraction;

counting the number of whole reference pulses between the leading edges of the first and second timing pulses;

subtracting the first timing fraction from the count; and

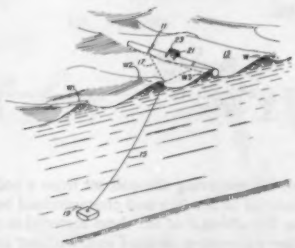
adding the second timing fraction to the count and producing a timing measurement in reference signal pulses.

4,158,306

WAVE DIRECTION MEASUREMENT AND RECORDING

Edward C. Brainard, II, Marion, Mass., assignor to Environmental Devices Corporation, Marion, Mass.

Filed Jan. 11, 1978, Ser. No. 868,619
Int. Cl.[2] G01W *1/00*
U.S. Cl. 73—170 A 10 Claims



1. Apparatus for detecting the direction of surface waves on a body of water; said apparatus comprising:

a buoyant elongate spar;

tether means of applying a restraining force essentialy transverse to and through the midpoint of the longitudinal axis of said spar's length; and

compass means carried by said spar for providing a signal representing the orientation of said spar, whereby said

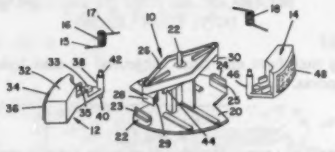
signal provides an indication of the direction of surface waves which orient said spar.

4,158,307

GOVERNOR ROTOR ASSEMBLY

Frederic A. Schwager, Manhattan Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Jul. 17, 1978, Ser. No. 925,254
Int. Cl.[2] G01D *13/14, 13/28*
U.S. Cl. 73—535 **4 Claims**



1. In a governor, the combination comprising:

a housing having an inner surface generally circular in cross-section;

first and second counterweight members, each of said counterweight members having a pivot pin adjacent an end thereof; and

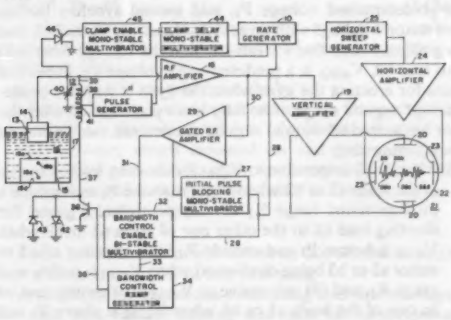
a one-piece rotor rotatably mounted within said housing, said rotor having a shaft, a base portion generally perpendicular to said shaft, and a cross-member spaced from and generally parallel to said base portion, said base portion being provided with a pair of diametrically opposed tangentially extending generally U-shaped recesses having the open ends thereof facing in the intended direction of rotation of said rotor, said cross-member having a second pair of diametrically opposed tangentially extending U-shaped recesses with the open ends thereof facing in a direction opposite the direction of intended rotation of said rotor, said second pair of recesses being in facing relation relative to said recesses in said base portion, one pair of facing recesses being so configured and so aligned for receiving therein a pivot pin of one of said counterweights with said pivot pin aligned generally parallel relative to said shaft whereby to enable said counterweight to be pivoted radially outwardly toward the inner surfaces of said housing during rotation of said rotor.

4,158,308

TIME-VARIABLE BANDWIDTH ULTRASONIC TESTING APPARATUS

Donald E. Sharpe, Woodbury, and Howard E. Van Valkenburg, New Fairfield, both of Conn., assignors to Automation Industries, Inc., Los Angeles, Calif.

Filed Sep. 22, 1977, Ser. No. 835,506
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—609 **4 Claims**



1. Ultrasonic nondestructive testing apparatus for use with transducer means adapted to transmit ultrasonic energy into a test object in response to electrical signals and for deriving electrical signals in response to ultrasonic energy reflected from an outer surface of and from within the test object, said apparatus comprising:

a pulser adapted to be coupled to the transducer means for supplying electrical signals thereto during repetitive testing intervals;

(a) signal translating means having an input circuit adapted to be coupled to the transducer means for translating electrical signals derived by the transducer means in response to reflected ultrasonic energy and having output circuit means, said input circuit including a resonant circuit exhibiting inductance and capacitance resonant at a selected frequency and having a variable resistance responsive to a control signal whereby said signal translating means exhibits a bandwidth variable over a range of bandwidths;

a control signal generator coupled to said variable resistance for deriving a control signal to vary said bandwidth of said signal translating means during each of said repetitive testing intervals;

means operable synchronously with said pulser and coupled to said resonant circuit for inhibiting free electrical oscillations in said resonant circuit at a selected time following a pulse of said electrical signals derived by said pulser;

means coupled to said output circuit means and responsive to signals translated by said signal translating means for initiating said control signal in response to a signal representing ultrasonic energy reflected from an outer surface of the test object; and

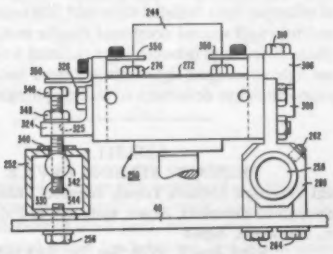
means coupled to said output circuit means of said signal translating means for utilizing electrical signals translated by said signal translating means.

4,158,309

VARIABLE MOUNTING ASSEMBLY FOR TRANSDUCERS EMPLOYED IN NUCLEAR REACTOR VESSEL INSPECTION APPARATUS

Hans J. Elsner, Pittsburgh; Ronald F. Antol, N. Huntingdon, and Raymond P. Castner, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 25, 1977, Ser. No. 781,380
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—641 **2 Claims**



1. A positionally variable transducer mounting assembly for removably securing a transducer with respect to an array plate comprising:

a rectangularly shaped bar having a longitudinal slot therein and bolted to said array plate;

at least two holders secured to said array plate and spaced apart from and parallel to said rectangularly shaped bar;

a circular bar held by said holders;

a yoke rotatably mounted on said circular bar and slidably mounted on said rectangularly shaped bar for positioning said yoke with respect to said array plate;

a retaining block having a circular bore therein and rotatably mounted on said yoke; and

a transducer mounted in said retaining block for inspecting metal surfaces.

4,158,310

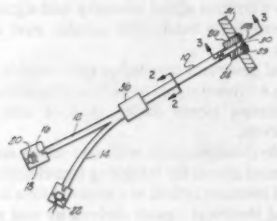
OPTICAL PRESSURE TRANSDUCER OF RANDOMLY DISTRIBUTED FIBER OPTICS

Chih-Ming Ho, Torrance, Calif., assignor to University of Southern California, Los Angeles, Calif.

Filed Jan. 30, 1978, Ser. No. 873,757

Int. Cl.[2] G01L *9/00*

U.S. Cl. 73—705 **4 Claims**



1. An optical pressure transducer comprising:

a source of coherent light;

means for light detection;

a pressure-responsive diaphragm having a light-reflective surface deflectable in proportion to a pressure differential across the diaphragm; and

a fiber optic bundle for transmitting light from said light source to said diaphragm surface and transmitting reflected light from said diaphragm surface to said light detection means comprising a first light source bundle having a plurality of optical fibers, one end of which is irradiated with coherent light from said light source, a second reflected light bundle having a plurality of optical fibers, one end of which conveys reflected light to said light detection means, and a combined bundle having an end consisting of the other ends of said light source bundle and reflected light bundle, said other ends being substantially randomly distributed across said combined bundle end, said diaphragm being positioned to reflect a portion of coherent light radiated from said first combined bundle end into said second combined bundle end, whereby the phase differential between light radiated from said coherent light source and light reflected from said diaphragm is proportional to deflection of said diaphragm.

4,158,311

PRESSURE SENSING DEVICE

Takeshi Yasuhara; Mitsuru Tamai; Tadanori Yuhara, and Isamu Asano, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jun. 6, 1978, Ser. No. 913,162

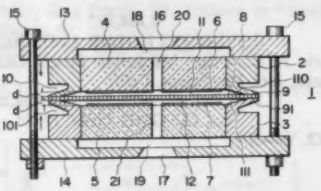
Claims priority, application Japan, Jun. 9, 1977, 52-67281

Int. Cl.[2] G01L *9/12*

U.S. Cl. 73—718 **19 Claims**

1. In a pressure measuring device of the type in which a flexible sensing member is disposed between first and second housing members and the amount of movement of said sensing member is indicative of the magnitude of a pressure applied thereto, said device further including a fixing member disposed around the periphery of said housing members, the improvement comprising:

at least one of said sensing and fixing members being made of a precipitation hardenable metal contracted by a heat treatment process, said one of said members being under stress as a result of having been first secured to said housing members and then subjected to said heat treatment process.



4,158,312

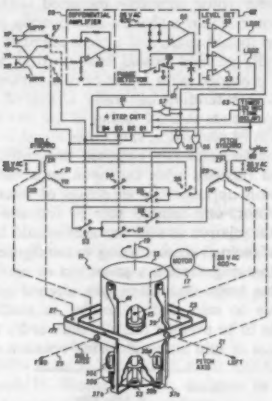
METHOD AND APPARATUS FOR GYRO ERECTION

Gordon R. Fabian; Leo P. Kammerer, and Lynn F. Maxedon, all of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 31, 1977, Ser. No. 801,501

Int. Cl.[2] G01C *19/28, 19/30, 19/54*

U.S. Cl. 74—5.43 **13 Claims**



1. In a gyro system having a gyro, rotor, motor means for producing rotor spin about a spin axis, inner and outer gyro gimbals and gimbal mounting axes, and first and second synchros for sending to using apparatus the rotational orientation of said spin axis about, respectively, the inner and outer gimbal mounting axes, said first synchro having three stator windings with three stator leads a1, b1, and c1, and being aligned such that for full erection the voltage from lead a1 to lead b1, V_{a1b1}, is a predetermined voltage P_1, said second synchro having three stator windings with three stator leads a2, b2, and c2, and being aligned such that for full erection the voltage from lead a2 to lead b2, V_{a2b2}, is a predetermined voltage P_2, improved means for erecting the gyro when the gyro is within a predetermined angular range of its fully erect position and after the rotor has gained substantial angular momentum, said improved means comprising:

first means (i) responsive to V_{a1b1} for shorting lead c2 to one of the leads a2 or b2 when V_{a1b1} is above P_1 and outside a predetermined range R_1 of voltage around P_1, and for shorting lead c2 to the other one of leads a2 or b2 when V_{a1b1} is below P_1 and outside R_1, said shorting of c2 to either a2 or b2 being disallowed when V_{a1b1} is within said range R_1, and (ii) responsive to V_{a2b2} for shorting lead c1 to one of the leads a1 or b1 when V_{a2b2} is above P_2 and outside a predetermined range R_2 of voltage around P_2, and for shorting lead c1 to the other one of leads a1 or b1

when V_{a2b2} is below P_2 and outside R_2, said shorting of c1 to either a1 or b1 being disallowed when V_{a2b2} is within said range R_2, and

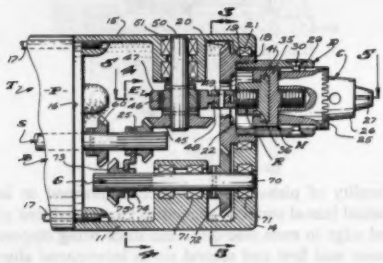
second means having output coupled to said first means for preventing substantial simultaneity of first synchro stator shorts and second synchro stator shorts.

4,158,313

ELECTRIC HAND TOOL

Arthur W. Smith, 1845 Randolph St., Los Angeles, Calif. 90001

Filed Jul. 13, 1977, Ser. No. 815,190
Int. Cl.² F16H *21/00*
U.S. Cl. 74—22 A **10 Claims**



1. A power tool comprising an elongate manually engageable housing with front and rear ends and defining a longitudinal axis of the tool, an elongate axially extending rotary drive tube rotatably supported by the housing and having a rear end portion accessible from within the housing and a forward portion projecting forwardly from the housing, an elongate chuck with a rear portion projecting into the tube and a forward tool bit engaging portion projecting forwardly from the tube, rotary coupling means between the tube and the chuck establishing rotary driving engagement therebetween, an axially shiftable drive member rearward of the chuck, axial coupling means between the chuck and the member establishing axial driving engagement therebetween, said axial driving engagement being substantially free of lost motion between said drive member and said chuck, a prime mover in the housing, a power transmission connected with the prime mover and including an eccentric drive means connected with said member and a rotary driven element connected with the tube.

4,158,314

HIGH SPEED STATOR WINDER

Hyman B. Finegold, Dayton, Ohio, assignor to The Globe Tool and Engineering Company, Dayton, Ohio

Filed Nov. 17, 1977, Ser. No. 852,566
Int. Cl.² F16H *22/44*
U.S. Cl. 74—23 **3 Claims**

1. Apparatus for converting rotary motion to combined reciprocating and oscillating motion of a ram comprising:

a drive shaft,

a cam mounted on said drive shaft,

a first carriage mounted for movement in a first path perpendicular to the axis of rotation of said drive shaft,

cam follower means mounted on said first carriage and engaging said cam so that, upon rotation of said drive shaft, said first carriage is caused to reciprocally move along said first path,

a second carriage,

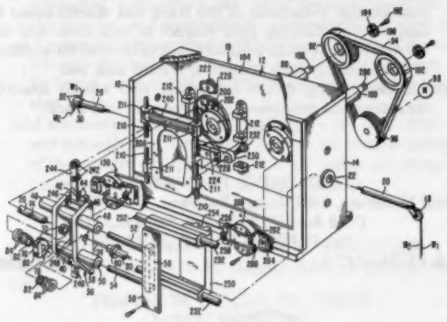
a rack bar mounted for movement on said second carriage in a direction parallel to said first path,

motion transmitting means connecting said first carriage to said rack bar for causing said rack bar to reciprocally move with said first carriage,

means guiding said second carriage for movement in a second path perpendicular to said axis of rotation of said drive shaft and perpendicular to said first path,

means mounting said ram on said second carriage with the longitudinal axis of said ram parallel to said second path,

pinion means affixed to said ram driven by said rack bar to cause oscillation of said ram about its said longitudinal axis in response to reciprocal movement of said first carriage,



a crank arm connected to said drive shaft for rotation therewith,

a crosshead mounted on said crank arm, and

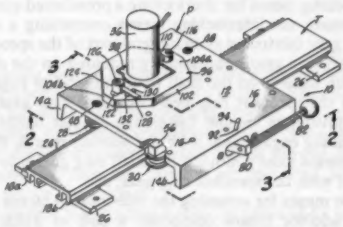
means defining a yoke on said second carriage engaged by said crosshead so that said second carriage is caused to reciprocally move along said second path when said drive shaft is rotating.

4,158,315

TRACK GUIDED CARRIAGE UNIT

Milo M. Kensrue, 56 Linda Isle, Newport Beach, Calif. 92660, and Donald L. Martin, 12132 Woodlawn Ave., Santa Ana, Calif. 92705

Filed Dec. 23, 1977, Ser. No. 863,708
Int. Cl.² F16H *19/04*
U.S. Cl. 74—31 **23 Claims**



1. A track guided carriage unit capable of selectively mounting and transporting a variety of work performing devices along a predetermined work path, comprising:

(a) an elongated guide track having V-surfaces extending along its opposite sides and a longitudinally extending rack extending along the V-surfaces on one side of said track;

(b) a main mounting platform transversely spanning said track and having a generally flat surface for the mounting of a work performing device thereon;

(c) a plurality of platform supporting wheels carried by said platform, said wheels having V-surfaces for engaging the V-surfaces along the opposite sides of the track, the wheels for engaging the V-surfaces on said one side of the track comprising a pair of wheels having fixed axes of rotation, and the wheels for engaging the V-surfaces on the opposite side of the track comprising a pair of wheels

supported for unitary movements towards and away from the track into clamped and non-clamped positions with respect to said track, and in the non-clamped position enabling separation of said platform from said track;

(d) power driving means mounted on said platform including a driving pinion, positioned between said pair of wheels having the fixed axes of rotation, for operative engagement with said rack when the platform wheels are moved into clamped position with the track, and in which position the V-surfaces of the track and wheels coact to support the platform with respect to two axes, and the driving pinion coacts with said rack to control the position of the platform with respect to a third axis; and

(e) loading spring means for urging said wheels towards their clamped positions with respect to said track.

4,158,316

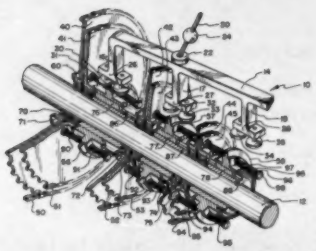
CHAIN-DRIVE TRANSMISSION

Grant H. Strong, 1407 Sunset, Richland, Wash. 99352

Filed Sep. 14, 1977, Ser. No. 833,327

Int. Cl.[2] F16H *9/00, 9/24, 11/08*

U.S. Cl. 74—217 S **7 Claims**



1. A chain-drive transmission comprising:

a rotatable shaft;

a plurality of sprockets rotatably mounted on the shaft, each sprocket having a different outside diameter to provide the transmission with a plurality of speed ranges corresponding with the outside diameters of the sprockets;

interlocking means for interlocking a preselected sprocket to the shaft, the interlocking means comprising a sprocket ring gear fabricated as an integral part of the sprocket and a shaft ring gear non-rotatably mounted on the shaft and axially slidable on the shaft to accommodate engagement with the sprocket ring gear, the shaft ring gear further comprising an annular flange, the annular flange accommodating engagement with the selector means, the selector means axially moving the shaft ring gear into engagement with the sprocket ring gear; and

selector means for actuating the interlocking means wherein the selector means comprises a pair of guide wheels adapted to bracket the annular flange, the guide wheels bracketing the annular flange and pressing against the annular flange in rolling relationship to shift the shaft ring gear axially in a preselected direction.

4,158,317

INFINITE RATIO TRANSMISSION

Robert G. James, 3509 Janene Way, Bakersfield, Calif. 93306

Filed Jan. 16, 1978, Ser. No. 869,574

Int. Cl.[2] F16H *15/50, 13/06, 3/74*

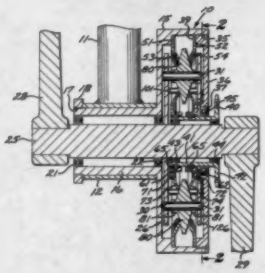
U.S. Cl. 74—796 **12 Claims**

1. A variable ratio transmission comprising:

a first set of circular elements including first and second annular, substantially planar spring members aligned coaxially at a predetermined increment of axial separation;

a second set of circular elements including third and fourth annular, substantially planar, spring members aligned coaxially at said predetermined increment of axial separation, said third and fourth members having exterior peripheries substantially smaller than the interior peripheries of said first and second members;

mounting means conformed to retain said first and second sets of circular elements in coencentric alignment the respective members thereof being limited to said predetermined increment of separation; and



a plurality of planetary discs each conformed to include conical lateral surfaces aligned to form a reduced peripheral edge in each said disc, said discs being disposed between said first and second set in interspaced alignment between said members thereof.

4,158,318

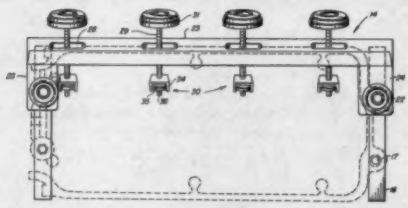
CAM REMOVING TOOL

William A. Strametz, 897 State Rd. 427, Longwood, Fla. 32750

Filed Jan. 19, 1978, Ser. No. 870,659

Int. Cl.[2] B23P *19/04*

U.S. Cl. 81—3 R **7 Claims**



1. A tool for holding the rocker arms of an engine off a cam during removal of the cam comprising in combination:

a frame;

cylinder head attaching means for removably attaching said frame to a cylinder head;

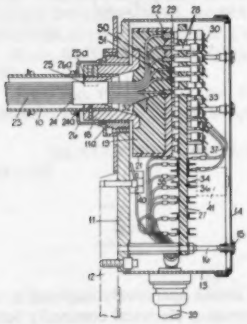
a plurality of rocker arm drive members movably attached to said frame each said rocker arm drive member being slidably mounted through said frame for adjusting the position of said rocker arm drive member; and

a rocker arm engaging member attached to each said rocker arm drive member for engaging a rocker arm, whereby said rocker arm drive member is adapted to drive said rocker arm engaging member to force said rocker arm off an engine cam so that the cam can be removed from the cylinder head of the engine.

4,158,319
CONTROLS FOR MULTI-SPINDLE LATHES

Alec G. Blockley, and Edmund A. McConnell, both of Coventry, England, assignors to Wickman Machine Tool Sales Limited, Coventry, England

Filed Feb. 8, 1978, Ser. No. 875,976
Claims priority, application United Kingdom, Feb. 19, 1977, 7108/77
Int. Cl.² B23B 3/24, 3/00
U.S. Cl. 82—3 10 Claims

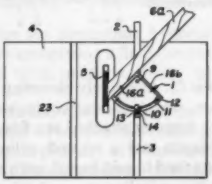


1. A multi-spindle lathe comprising a base, a drum mounted on the base, a plurality of spindles rotatably mounted in the drum, the drum being indexable between a number of finite positions, a multi pole rotary electrical switch associated with the drum, multiple electrical circuits to the drum arranged to be controlled by said multi pole rotary electrical switch, a rotatable part and a fixed part of the switch, equal numbers of co-operable electrical contacts on the rotatable and fixed parts of the switch respectively, electrical circuits of which the electrical contacts form part, at least two continuous conductor rings one one of the parts engaging the conductor rings respectively, further respective electrical circuits of which the rings and contacts form part, the fixed part being fixed relatively to the base of the lathe and the rotatable part being indexable with the drum, selection of any one of the possible positions of the switch providing simultaneous connection between a number of said co-operable contacts and also the conductor rings being in contact with their contacts at all possible positions of the switch, and control being provided for controlling the electrical supply to the co-operable contacts and to the rings and their contacts in accordance with predetermined requirements.

4,158,320
MITER DEVICE

Spencer Kay, Edmonton, Canada, assignor to Nation Wide Manufacturing Co., Edmonton, Canada

Filed Dec. 20, 1977, Ser. No. 862,537
Int. Cl.² B27G 5/02
U.S. Cl. 83—425 4 Claims



2. A miter device slidable in the linear grooves formed on a wood-cutting saw table on each side of the cutting blade, which comprises:

a jig having a pair of work-supporting jig faces disposed to form a 90° apex;

a guide rail for sliding along either of the grooves;

said jig being rotatably mounted on the guide rail at a point along the bisector of the right angle;

said jig having a curved slot opposite the right angle, a graduated scale along the outer circumference of the circular slot, and abutments at each end of the curved slot;

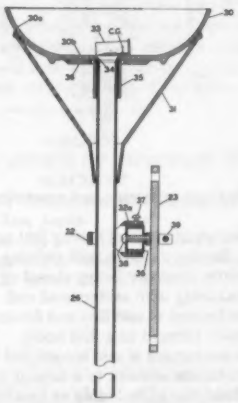
said guide rail having an upright clamping means protruding through the curved slot of the jig operative to clamp the jig to the guide rail at the desired setting along the graduated scale; and

said abutments being oriented radially on the face of the jig and through which stops can be inserted to limit the path of the upright clamping means on the guide rail along the curved slot on the face of the jig.

4,158,321
CASING FEEDER FOR A SHELL RELOADER

Robert L. Meacham, 472 N. Oakhill Ave., Janesville, Wis. 53545

Filed Jul. 26, 1977, Ser. No. 819,156
Int. Cl.² F42B 33/10
U.S. Cl. 86—45 5 Claims



1. A casing feeding device for feeding shell casings having a heavy end and adaptd for use with a shell reloading machine of the type including a manual operating handle, a link connected to the handle for reciprocation upon rotation of the handle, and a casing receiver for receiving shell casings rim end downward and transfering them into position for reloading, said casing feeding device comprising:

(a) an upright loading tube having an upper and a lower end, said tube being adapted to receive a column of casings and having its bottom end supported on the casing receiver of the shell reloading machine in position to deliver the column of casings therein to the casing receiver;

(b) a casing hopper mounted on the upper end of said loading tube and having upwardly extending sides and a substantially flat bottom, said bottom having a substantially circular discharge opening therein for receiving casings from said hopper and discharging them into said loading tube, the diameter of said discharge opening being greater than the distance from the rim end of the casing to be fed to the center of gravity thereof and less than the distance from the open end of the casing to its center of gravity, whereby casings will drop rim end first into said discharge opening without the need for moving parts in said hopper; and

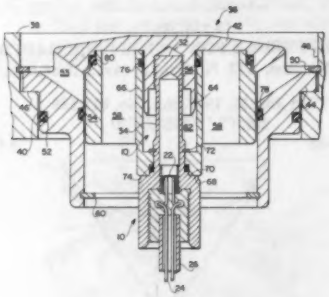
(c) a tube support collar loosely encircling said loading tube, said collar having mounting means for mounting said collar to the reciprocal link of the shell reloading machine

to support said loading tube in an upright position on the casing receiver whereby when the handle of the shell reloading machine is manually operated, the resultant reciprocation of said link causes said tube support collar to rock said loading tube and casing hopper thereon providing migration of casings in said hopper randomly to said discharge opening into which casings drop rim end first because of the greater weight of the rim end.

4,158,322
PYROTECHNIC SEPARATION DEVICE

Thomas K. C. Hardesty, Ednor, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 22, 1977, Ser. No. 826,509
Int. Cl.[2] F16K *17/40*; F42B *22/00*
U.S. Cl. 89—1 B **13 Claims**



1. A unified gas generator and separation device, comprising:

an elongate tensile element having first and second ends, said element having a fusible wall defining a central chamber, said central chamber being closed at said first end and communicating with said second end;

first means located at said first end for connecting said elongate tensile element to a first body;

second means located at said second end for connecting said elongate tensile element to a second body;

a pyrotechnic charge including an exothermic mixture and a gas producing chemical retained within said central chamber;

means communicating with said chamber for igniting said pyrotechnic charge in response to a signal; and

means attached to said elongate tensile element for closing said second end;

whereby ignition of said pyrotechnic charge causes both evolution of heat which melts the fusible walls of said tensile element, and evolution of gas which urges said fused tensile element to part.

4,158,323
TRAINING FLARE DISPENSING SYSTEM

William M. Stirrat, Sparta, and Donald H. Brandt, Wayne, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 27, 1978, Ser. No. 872,856
Int. Cl.[2] F41F *5/00*
U.S. Cl. 89—1.5 R **5 Claims**

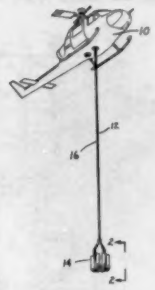
1. A flare lighting system for safely simulating artillery delivered parachute flares assemblies over a target area containing troops engaged in nighttime tactical training exercise which comprises:

lifting means for carrying said parachute flare assemblies to said target area and for electrically initiating said parachute flare assemblies when positioned over said target area;

tethering means adapted for supporting said parachute flare assemblies a safe distance from said lifting means;

housing means for releaseably holding a plurality of said parachute flare assemblies therein during loading and transport to said target area;

electrical power cable means for electrically coupling said lifting means to said housing means;

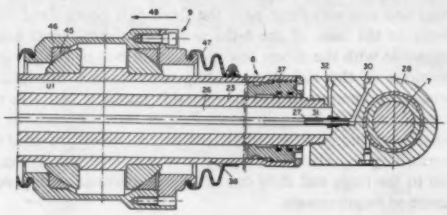


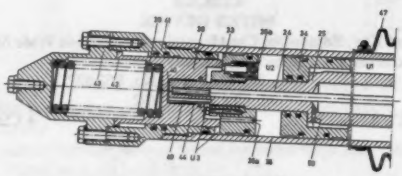
electrical control means operatively disposed in said lifting means for determining electrical continuity between said lifting means and said parachute flare assemblies and for providing electrical switching means for safing, arming and initiating said parachute flare assemblies over said target area.

4,158,324
HYDRAULIC CYLINDER ASSEMBLY FOR POSITIONING AN ARTILLERY BARREL

Gustav H. Tidemalm, and Björn E. Vidinghoff, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Jun. 27, 1977, Ser. No. 810,466
Int. Cl.[2] F41F *21/08*
U.S. Cl. 89—41 H **9 Claims**





1. An apparatus for selectively elevating a barrel of an artillery type weapon, said apparatus comprising:

a first cylinder member attached at a first end portion to said artillery weapon and a second cylinder member being rotatably attached to said barrel, with said first and second cylinders telescopically arranged relative to one another;

a piston assembly including a fixed piston and a movable piston positioned within said telescoping cylinders, with a fluid medium selectively introduced through passages in

said telescoping cylinders for contact with said piston assembly, causing relative displacement of said cylinders; and

means formed in at least one fluid passageway extending through said piston assembly to control the flow of said fluid medium and provide a dampening force against movements of said barrel.

4,158,325

METHOD AND APPARATUS FOR PRODUCING A THREE-DIMENSIONAL FORM FROM A PHOTOGRAPHIC IMAGE OF THAT FORM

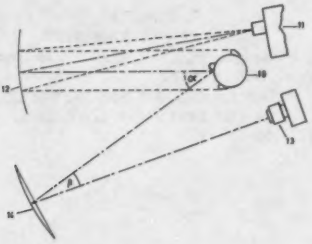
Kenneth G. Dixon, 63 Westfarm Ave., Ashtead, Surrey, England (KT212JZ)

Filed Sep. 19, 1977, Ser. No. 834,395

Claims priority, application United Kingdom, Sep. 30, 1976, 40633/76

Int. Cl.² B23Q *33/00, 35/00*

U.S. Cl. 409—115 **9 Claims**



1. A method of reproducing a three dimensional form from a photographic image of that form, comprising the steps of, projecting an image of a series of uniformly spaced parallel lines onto the object to be reproduced in the form of a parallel beam, photographing the object together with the superimposed lines by way of reflection off a first spherical mirror, projecting an image of the photograph so taken onto a screen by way of a second identical spherical mirror, tracing out each of the superimposed contour lines on the image on the screen in turn by way of a stylus linked by way of a pantograph to a cutting tool which is arranged to cut out a corresponding contour on a block of material to be formed into said three dimensional form wherein the said block of material is advanced both horizontally forwards and vertically downwards with respect to the plane of movement of said cutting tool before each new contour line is traced out by said stylus.

4,158,326

CONTROL DEVICE

Karl Krieger, Wuppertal, Fed. Rep. of Germany, assignor to Hermann Hemscheidt Maschinenfabrik, GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 830,892

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 2640185

Int. Cl.² F15B *11/20*

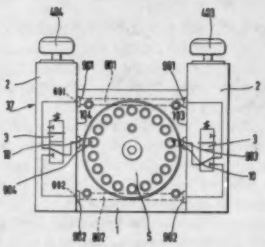
U.S. Cl. 91—508 **9 Claims**

1. A control device for controlling hydraulically actuated equipment, the device comprising a fluid distributing block and a plurality of control valve units detachably mounted side-by-side on the block,

the block being formed with an inlet opening, an outlet opening, a plurality of control line openings, a plurality of delivery openings, a plurality of return openings, a plurality of valve unit communicating openings, and internal passage means,

said internal passage means connecting the inlet opening with each of the delivery openings, connecting the outlet opening with each of the return openings, and connecting the control line openings with respective corresponding ones of the valve unit communicating openings,

the control valve units each comprising a housing having first second and third openings, an operating member, and a control valve member movable within the housing by means of the operating member two operating positions, the control valve member when in its first position connecting the first opening to the second opening, and when in its second operating position connecting the first opening to the third opening, the said first opening of each valve unit registering with a said valve unit communicating opening of the block, the said second opening of each valve unit registering with a said delivery opening of the block, and the said third opening of each valve unit registering with a said return opening of the block.



4,158,327

MOLD CLOSING DEVICE OF INJECTION MOLDING MACHINE

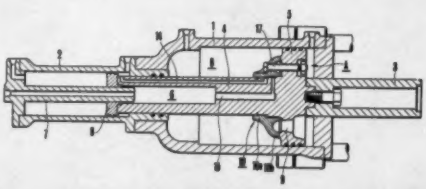
Katashi Aoki, 6037, Ohazaminamijo, Sakakimachi, Hanishinagun, Nagano-ken, Japan

Filed Sep. 23, 1977, Ser. No. 836,217

Claims priority, application Japan, Sep. 30, 1976, 51/117470

Int. Cl.² B29C *3/00*; F15B *11/18*

U.S. Cl. 91—519 **5 Claims**



1. In a mold closing device of an injection molding machine having a mold closing cylinder, a mold closing piston located within said mold closing cylinder, a mold closing ram affixed to said piston extending toward an injection mold, a quick shifting ram affixed to said piston extending away from an injection mold in the direction opposite that of said mold closing ram, two chambers within said cylinder, one formed on either side of said piston, oil ports passing through said piston allowing communication between said chambers, and a disk valve slidably fitted to the base of said quick shifting ram for opening and closing said ports, said disk valve having a disk portion formed on the end of a cylindrical portion, said disk portion facing said ports, an hydraulic means for acutating said disk valve comprising:

a piston ring secured to said quick shifting ram slidably engaging a portion of the inner surface of said disk valve and forming a seal between said inner surface of said disk valve and said outer surface of said quick shifting ram;

a first valve controlling oil chamber formed between said inner surface of said disk valve and said outer surface of

said quick shifting ram hydraulically actuable for urging said disk valve into a position opening said ports;

a second valve controlling oil chamber formed between said inner surface of said disk valve and said outer surface of said quick shifting ram and sealingly separated from said first valve controlling oil chamber by said piston ring, said second valve controlling oil chamber being hydraulically actuable for urging said disk valve into a position closing said ports;

a quick return cylinder axially disposed in the end of said mold closing cylinder facing away from an injection mold and hydraulically actuable for urging said piston in an axial direction away from an injection mold in a mold opening phase of operation;

a forward cylinder formed in a cavity in the portion of said quick shifting ram facing away from an injection mold and hydraulically actuable for urging said piston in an axial direction toward an injection mold in mold closing and mold clamping phases of operation;

a first oil passage allowing hydraulic communication between said quick return cylinder and said firt valve controlling oil chamber for applying hydraulic pressure to said first valve controlling oil chamber for urging said disk valve into said open position in said mold opening phase of operation; and

a second oil passage allowing hydraulic communication between said forward cylinder and said second valve controlling oil chamber for applying hydraulic pressure to said second valve controlling oil chamber for urging said disk valve into said closed position in said mold clamping and said mold closing phases of operation.

4,158,328

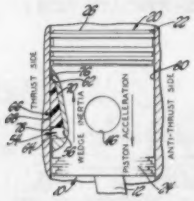
PISTON WITH VARIABLE SIDE CLEARANCE

John M. Beardmore, South Lyon, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 23, 1977, Ser. No. 835,903

Int. Cl.[2] F16J 1/04

U.S. Cl. 92—212 **4 Claims**



1. A variable side clearance engine piston capable of reducing piston slap noise by reducing the piston side clearance in an associated cylinder near the top dead center position of piston movement, said piston having

a closed end

pin bearing means spaced axially from the closed end for connecting the piston in load transmitting relation to a connecting rod for oscillation on a transverse axis with respect to the rod,

a skirt having generally part-cylindrical cylinder engaging portions disposed on laterally opposite sides of said transverse axis to carry major and minor thrust loads imposed on the piston, one of said cylinder engaging portions having an outwardly opening recess of less than semi-cylindrical circumferential extent and with an inner side tapered outwardly in the direction of the closed end to provide reduced recess depth toward the closed end, and

a floating wedge insert loosely retained in the recess, said insert having a tapered surface engaging the recess inner side and a part-cylindrical cylinder engagable surface opposite its tapered surface and parallel with the adjoining portion of the skirt, said wedge having a circumferential extent not greater than the recess and an axial length substantially less than that of the recess to permit in operation inertia caused axial movement of said wedge in said recess between first and second positions, respectively closer to and further from said piston closed end, said floating wedge having a thickness at its thinner end greater than the depth of said recess at its shallower end, whereby movement of the wedge toward the piston closed end due to opposite piston acceleration reduces the piston side clearance along the line of side thrust loading, thereby reducing piston slap motion at the end of respective piston strokes, while opposite movement of the wedge due to opposite piston acceleration increases the side clearance to promote skirt lubrication and free running.

4,158,329

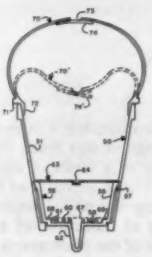
DRIP COFFEE BREWER

Robert J. McKnight, Bldg. 10, Apt. 5, Jamestowne Village, Toms River, N.J. 08753

Filed Apr. 24, 1978, Ser. No. 899,320

Int. Cl.[2] A47J 31/02, 31/06, 31/32

U.S. Cl. 99—295 **44 Claims**



1. A drip coffee brewer for the brewing of a single serving of coffee comprising a standard foam-plastic hot-beverage cup with a portion of the bottom omitted or removed, and with a cup-shaped capsule inserted in the bottom portion thereof, the capsule having a flared lip with an outside diameter slightly larger than the inside diameter of the beverage cup at the point of contact in the seated position, tending to wedge the capsule securely in position, the capsule having on the bottom thereof a raised filter-supporting grid consisting of approximately equally spaced concentric raised ridges with troughs therebetween, the troughs connecting to a plurality of radial ducts leading to a central closed drain spout, the end of which must be cut off to permit fluid to escape; and with a circular multi-pierced disc supported on the lip of the capsule.

4,158,330

DUAL VENTED BREWER

Charles J. Vitous, Berwyn, Ill., assignor to Cory Food Services, Inc., Chicago, Ill.

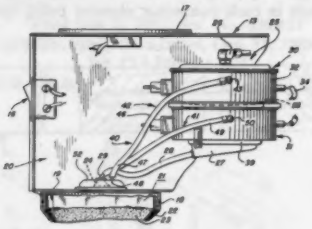
Filed Aug. 2, 1978, Ser. No. 930,814

Int. Cl.[2] A47J 31/00

U.S. Cl. 99—295 **7 Claims**

1. In a coffee brewer having water heating means including a plurality of vertically juxtaposed heating devices each defined by a heat fransfer mass and means for heating the mass,

and a cartridge for receiving hot water from the heating means, the improvement comprising



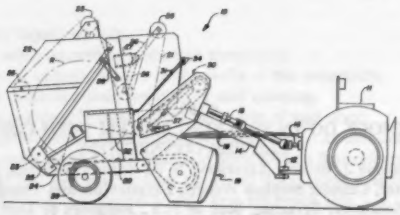
a plurality of vent means for venting each of the heating devices individually into the interior of said cartridge.

4,158,331

CENTER PIVOT DISPENSING APPARATUS

Willis R. Campbell, Ephrata, and John H. Freimuth, New Holland, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Apr. 7, 1978, Ser. No. 894,458
Int. Cl.[2] B65B *13/18*
U.S. Cl. 100—5 **15 Claims**



1. A crop roll forming machine for forming large cylindrically shaped bales and for wrapping the bales with a binding material which comprises:

(a) a mobile frame;

(b) bale forming means movably mounted to the frame;

(c) a bale forming region defined generally by the frame and the bale forming means;

(d) wrapping means mounted to the frame for controlling the wrapping of a completed bale with the binding material;

(e) at least a first and a second binding material dispensing means adjacent the bale forming region connected to the wrapping means;

(f) a power transfer means connecting the first and the second dispensing means;

(g) drive means mounted to the frame and drivingly connected to the bale forming means and the wrapping means, the drive means comprising a driven link having a first and a second end, the link being pivotably fastened at the first end to the power transfer means;

(h) a rotable curvilinearly surfaced cam plate operably connected to the wrapping means; and

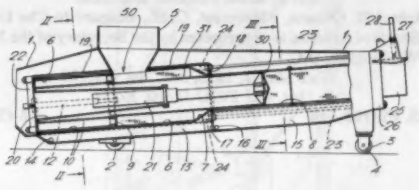
(i) a roller plate connected to the driven link at the second end and in driven engagement with the rotatable curvilinearly surfaced cam plate so that upon actuation of the wrapping means the driven link drives the first dispensing means across a portion of the bale forming region in a first predetermined path and the second dispensing means in a second predetermined path, the paths being adjacent the completed bale and adjacent each other so as cumulatively to be substantially co-extensive with the width of the bale forming region to thereby effect the wrapping of the bale substantially across its length in response to the movement of the roller plate about the curvilinear surface of the cam plate as the bale is rotated by the bale forming means.

4,158,332

CONTINUOUS CYCLE DEMUSTER PRESS WITH COAXIAL PISTONS

Primo Melandri, Lugo, Italy, assignor to Diemme S.p.A., Lugo, Italy

Filed Mar. 1, 1978, Ser. No. 882,164
Claims priority, application Italy, Mar. 7, 1977, 46830 A/77
Int. Cl.[2] B30B *9/06*
U.S. Cl. 100—127 **9 Claims**



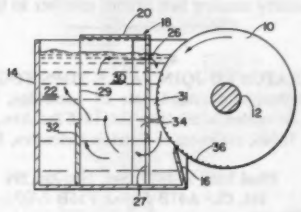
1. A demuster press comprising a first perforated cylinder, a second perforated cylinder axially aligned with the first cylinder, said second cylinder having a diameter smaller than the first cylinder, means connecting said first cylinder to said second cylinder so that said second cylinder forms a smaller diameter extension of the first cylinder, a cylindrical pressing piston inside said second cylinder, said pressing piston having a skirt extending into said first cylinder, an annular demusting piston in said first cylinder between said skirt and said first cylinder, means defining an opening for feeding a material to be demusted into said first cylinder, means for moving said demuster piston toward said second cylinder to demust material in the first cylinder, means for moving said pressing piston into said second cylinder to compress material in the second cylinder and including means to withdraw the pressing piston from the second cylinder so that the demusting piston can force material from the first cylinder into the second cylinder.

4,158,333

INKING BAFFLE FOR ROTARY NEWSPAPER PRESSES

Menashe Navi, Lebanon, N.J., assignor to ANPA Research Institute, Easton, Pa.

Filed May 1, 1978, Ser. No. 901,652
Int. Cl.[2] B41F *31/06*; B41L *27/08*
U.S. Cl. 101—363 **8 Claims**



1. In a printing system of the type embodying a rotatable inking cylinder contactable with printing ink within an ink reservoir, the improvement comprising:

A. A baffle supported in said reservoir adjacent said inking cylinder, said baffle further including:

i. a series of vertically disposed plates mounted in side-by-side array perpendicularly to the axis of said inking cylinder;

ii. a unitary front ink flow guide interconnecting said

plates along the axis of said inking cylinder, so as to define an ink into contact aperture in the upper portion of said ink flow guide and an ink outflow aperture in the lower portion of said ink flow guide, a median portion of said ink flow guide intermediate said ink into contact and outflow apertures defining a transverse baffle across said reservoir and in parallel with the axis of said inking cylinder, and

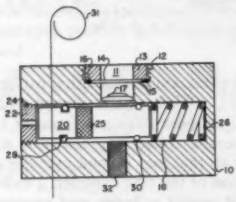
iii. a unitary back ink flow guide interconnecting the bottom rear of said vertically disposed plates, so as to define an ink outflow guide across the bottom of said reservoir.

4,158,334

SAFE/ARM FIRING DEVICE

Michael R. Osburn, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 2, 1978, Ser. No. 902,128
Int. Cl.[2] F42C *15/10, 15/32*
U.S. Cl. 102—16 **6 Claims**



1. An out-of-line safe/arm device which maintains a percussion primer member, detonator member and output lead member in a out-of-line position until armed by pressure comprising;

a housing member;

an axially extending bore in said housing member;

a slider bore in said housing member extending transversely to said axially extending bore;

both said axially extending bore and said slider bore being in open communication with existing pressure outside said housing member;

slider means contained within said slider bore and adapted for movement axially with respect thereto;

said primer member being contained in said axially extending bore;

diaphragm means in said axially extending bore and sealing said primer member from outside pressure;

said diaphragm means being designed to burst at a predetermined outside pressure and impinge on said primer member thereby causing said primer member to ignite.

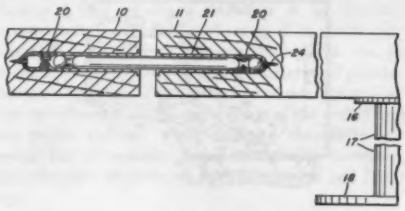
4,158,335

APPARATUS TO JOIN TABLE TOPS TOGETHER

Rosario Belcastro, deceased, late of Ambridge, Pa., and by Patricia Belcastro, administratrix, 1816 3rd Ave., New Brighton, Pa. 15066, assignors to Patricia Belcastro, Beaver Falls, Pa.

Filed May 9, 1977, Ser. No. 795,291
Int. Cl.[2] A47B *57/00*; F16B *7/00*
U.S. Cl. 108—64 **5 Claims**

1. Apparatus to removably join together two tables comprising the combination of first and second tables each including a support secured to a top having at least one planar edge, the planar edges of the two tops having equally-spaced and alignable bored openings, a sleeve member supported in each of said openings by the table tops, the internal projected portion of each sleeve member including a resilient circumferential constriction spaced from the terminal end of the sleeve member to lie within the table top, two elongated connector elements each including two circumferential recesses spaced from the terminal ends thereof to releasably receive said resilient circumferential constrictions in the sleeve members while supported in aligned openings in the two table tops, the circumferential recesses in each connector element being spaced by a



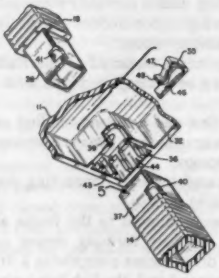
distance corresponding to the space between the circumferential constriction of two sleeve members while supported in aligned openings in the table tops when the planar edges thereof are disposed in a juxtaposed relation, and fastening means to secure each sleeve to a table top.

4,158,336

KNOCK DOWN SHELVING SYSTEM WITH CORNER CLIPPED CONNECTORS

Anthony J. Brescia, Liverpool, N.Y.; Edward G. Fecca, Kitchener, Canada; Stephen Wenczl, Fayetteville, and Theodore W. Schriever, Syracuse, both of N.Y., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Sep. 8, 1978, Ser. No. 940,811
Int. Cl.[2] A47B *3/06*
U.S. Cl. 108—111 **7 Claims**



1. A knock-down shelving system including, in combination:

(a) a plurality of shelves having shelf openings;

(b) a plurality of leg supports each having on upper end portion receivable in the bottom of a shelf opening and a lower end portion receivable in the top of a shelf opening and within the top end portion of another of said legs already positioned in the bottom of said shelf opening; and

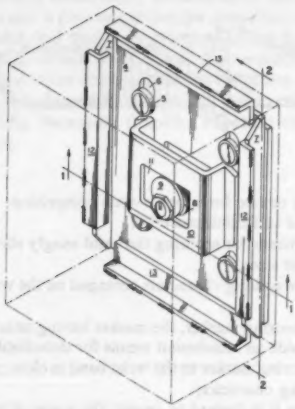
(c) manually insertable securing means for passing through side wall portions of said shelf opening, upper end portion and lower end portion when nested together to secure the leg supports to the shelves whereby any desired number of shelves and leg supports can be manually assembled and disassembled without the need of tools.

4,158,337

SAFE

Abraham Bahry, and Moshe Dolev, both of 45, Sokolov St., Holon, Israel

Filed Oct. 5, 1977, Ser. No. 839,617
Claims priority, application Israel, Oct. 11, 1976, 50659
Int. Cl.[2] E05G *1/026*
U.S. Cl. 109—59 R 5 Claims



1. An improved safe,
said safe comprising a box-like receptacle,
a cutout opening in one of the walls of the receptacle,
a flat plate-like door for closing said opening,
a panel movably attached to the inside of said door,
the panel having substantially the same shape as said door,
said panel being longer than said door along a first reference axis and being no longer than said door along a second reference axis normal to said first reference axis,
abutment means in said receptacle proximate said opening for retaining said door flush with said one wall,
locking means for moving said panel along said first reference axis between a first position and a second position,
said first position being where said panel extends beyond said door on only one side thereof, and
said second position being where said panel extends beyond said door on two opposite sides thereof and beneath the one said wall at the edges of the opening normal to said first reference axis.

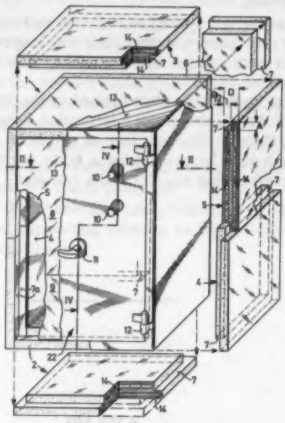
4,158,338

WALL PANEL AND ASSEMBLY

Johann Dippold, Plochingen, and Wolf von Tirpitz, Reudern, both of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Düsseldorf-Oberkassel, Fed. Rep. of Germany

Filed Oct. 7, 1977, Ser. No. 840,171
Claims priority, application United Kingdom, Oct. 11, 1976, 42123/76
Int. Cl.[2] E05G *1/024*
U.S. Cl. 109—79 13 Claims

1. A wall assembly comprising two wall panels,
(a) each panel having a thickness smaller than the length and width thereof and including two laminar units superimposed in the direction of said thickness, each unit including
(1) a core layer of particulate material having a hardness greater than 7 on the Mohs scale,
(2) a shell of perforated sheet material enveloping said layer, and
(3) a continuous mass consisting essentially of elastomeric material enveloping said shell and extending into said layer through the perforations of said shell, said mass bonding the particles of said layer to each other and to said shell,
(b) the masses of said two units being integrally connected to constitute a unitary body connecting said shells in a position in which a part of the core layer of one of said units projects beyond the core layer of the other unit by a distance at least equal to one quarter the thickness of said panel, but by not more than twice said thickness,
(c) said two panels engaging each other in a joint, the projecting part of the core layer in said one unit of each panel being aligned in said joint with a core layer in the other panel in the direction of the thickness of said one panel.



4,158,339

NARROW GAUGE CUT PILE LOOPER APPARATUS

Hoyt E. Short, Chattanooga, Tenn., assignor to Tuftco Corporation, Chattanooga, Tenn.

Filed Jun. 22, 1978, Ser. No. 917,863
Int. Cl.[2] D05C *15/00*
U.S. Cl. 112—79 R 7 Claims

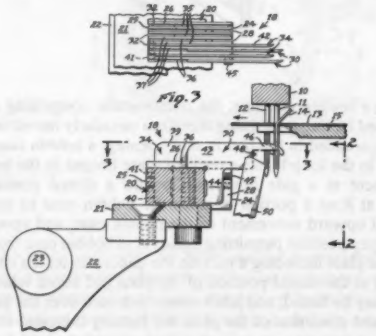


Fig. 3

1. In a tufting machine having means for supporting a base fabric for longitudinal movement in the feeding direction through said machine, a plurality of transversely spaced reciprocal needles for introducing yarns through said base fabric to form loops, looper apparatus comprising:

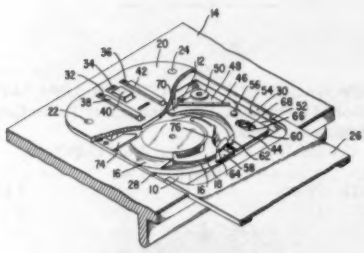
(a) a hook bar mounted transversely below the plane of the base fabric for longitudinal reciprocable movement between an operative position below said needles and an inoperative position,
(b) said hook bar having a front face and a rear face,
(c) transversely spaced front slots in said front face for receiving front loopers, so that each front looper will form a loop in a yarn carried by a first needle in said operative position,
(d) transversely spaced rear slots in said rear face for receiving rear loopers, so that each rear looper will form a loop in a yarn carried by a second needle in said operative position,
(e) longitudinal top slots formed in the top portion of said hook bar, each top slot intercepting a rear slot and extending through the front face of said hook bar, and
(f) each rear looper having a body portion received in a corresponding top slot and a rear slot.

4,158,340

HINGED BOBBIN CASE PLATE

William J. Edwards, Cranbury, N.J., assignor to The Singer Company, New York, N.Y.

Filed Jun. 12, 1978, Ser. No. 915,024
Int. Cl.[2] D05B 57/26
U.S. Cl. 112—231 **5 Claims**



1. In a sewing machine, the combination comprising a machine bed having an opening therein; a circularly movable loop taker journalled in the bed in said opening; a bobbin case supported in the loop taker; a resilient plate hinged in the bed for movement as a gate downwardly into a closed position in which at least a portion overlies the bobbin case to restrain vertical upward movement of the bobbin case, and upwardly to an open position permitting removal of bobbin case from the bed, the plate including a part on the underside which engages the bed in the closed position of the plate and about which the plate may be flexed; and latch means movable over the plate in the flexed condition of the plate for locking the plate closed.

4,158,341

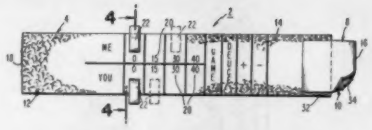
Patent Not Issued For This Number

4,158,342

SCORING DEVICE

Jack E. Scruggs, 3412 Brainerd Rd., Chattanooga, Tenn. 37411

Filed Aug. 25, 1978, Ser. No. 936,740
Int. Cl.[2] A63B 71/06
U.S. Cl. 116—225 **10 Claims**



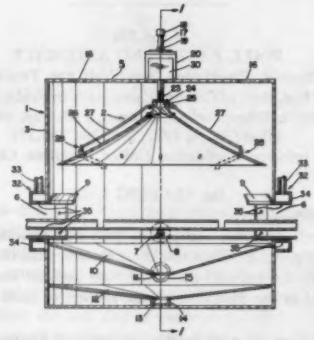
1. A scoring device for sports events comprising:
A wrist band of flexible material;
A securing means for securing the band snugly about wrists of different sizes;
A plurality of scoring characters arranged on the wrist band; and
at least one scoring marker, the marker having attached to at least one side an attachment means for detachably attaching the scoring marker to the wrist band in close proximity to a scoring character;
Whereby when it is desired to record the score of the sports event the scoring marker is attached to the wrist band in close proximity to the appropriate scoring character.

4,158,343

COATER

Eric T. Nord, Oberlin, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Continuation-in-part of Ser. No. 837,328, Sep. 27, 1977, abandoned. This application Sep. 5, 1978, Ser. No. 939,766
Int. Cl.[2] B05B 1/28, 3/00
U.S. Cl. 118—315 **15 Claims**



1. A coater comprising:
a coating chamber adapted to have a substrate conveyed through it, said coating chamber comprising a side wall portion, a bottom portion and a ceiling portion;

entrance and exit openings for a substrate to pass into and out of said chamber;

a plurality of spray coating nozzles disposed generally within the ceiling portion and directed generally at an area where a substrate is coated;

troughs on the side walls above said entrance and exit openings for the entire horizontal length of said openings; and

wherein said ceiling is adapted to rotate about an axis, has a generally horizontally oriented outer spinning edge portion and is disposed above the area where the substrate is coated, and said ceiling further having a continuous underside surface which slopes downwardly from said axis;

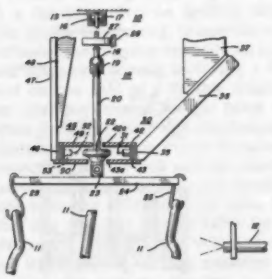
whereby liquid coating material collecting on said ceiling flows downwardly thereon and due to centrifugal forces is flung outwardly from the edge and clear of the substrate.

4,158,344

ELECTROSTATIC COATING SYSTEM

Thomas L. Bagby, Washington; Gary L. Demeny, Delavan, and Robert G. Smead, St. Charles, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 9, 1977, Ser. No. 849,818
Int. Cl.[2] B05B 5/02
U.S. Cl. 118—630 **20 Claims**



1. In a coating system having a conveyor with a supporting means for moving a workpiece through a coating zone, improved means for directing an electrostatic charge to a workpiece carried on said supporting means, comprising:

a conductor extending along the path of said supporting means through said coating zone;

a source of DC potential connected with said conductor to charge it at a high potential with respect to a potential reference;

a conductive charge collector operatively associated with said supporting means, for movement with the supporting means along and in spaced relation to said charged conductor through the electric field associated therewith, one of said conductor and said charge collector having a wide surface and the other having a narrow surface, the wide surface having a generally arcuate convex configuration presented to the narrow surface, both surfaces being free of sharp points, said surfaces being juxtaposed for current flow therebetween;

a high resistance connected between the collector and said potential reference, whereby an electric charge is induced on said collector by said field; and

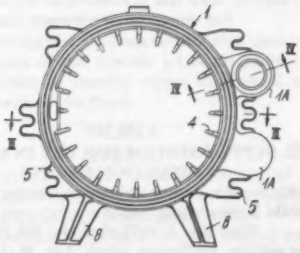
means electrically connecting said collector with the workpiece in load supporting relation to impart the induced electric charge thereto.

4,158,345

BOILER FOR LIQUID AND/OR GASEOUS FUELS

Alessandro Trestin, San Bonifacio, Italy, assignor to Fer Fabbrica Europea Riscaldamento S.p.A., Italy

Filed Jul. 28, 1977, Ser. No. 820,041
Claims priority, application Italy, Mar. 17, 1977, 21402 A/77
Int. Cl.[2] F22B 23/00, 27/08
U.S. Cl. 122—214 **4 Claims**



1. An improved boiler for liquid and/or gaseous fuels, comprising: a combustion chamber and a heat exchanger, said heat exchanger comprising at least one pair of hydraulically connected heat exchanger bodies located one after the other, each of said heat exchanger bodies having an axis and being provided with a finned conduit having a coil pattern defined by conduit lengths, said axis lying in a plane substantially at right angles to the path of the combustion products or fumes through said conduit and associated fins and further wherein said coil conduits and fins in the respective heat exchanger

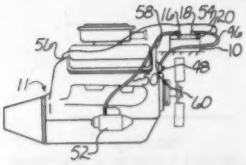
bodies are mutually staggered with respect to each other so that the conduit lengths of one body are interposed between the spaces defined between the conduit lengths of the other body.

4,158,346

ENGINE EFFICIENCY UNIT

Charles G. Roberts, Pontiac, and Ernest DeMichele, Farmington Hills, both of Mich., assignors to Mectronic, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 604,792, Aug. 14, 1975, Pat. No. 4,074,670. This application Jan. 9, 1978, Ser. No. 867,920
Int. Cl.² F02N *7/00*; F02B *77/00*
U.S. Cl. 123—1 R **13 Claims**



1. In combination with an internal combustion engine having an electrical system and a battery having a negative and a positive terminal connected to the engine electrical system, an energy efficiency device comprising:
- a pair of closely adjacent electrically conductive coils disposed on substantially parallel axes;
- means for mounting said coils adjacent one terminal of the battery; and
- a wire having one end adjacent said coils and its other end electrically connected to the other battery terminal.

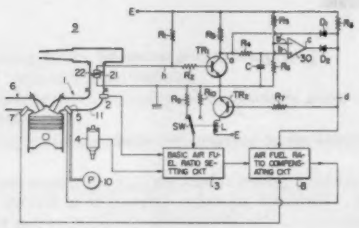
4,158,347

FUEL SUPPLY SYSTEM FOR USE IN INTERNAL COMBUSTION ENGINE

Keiji Aoki, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 3, 1977, Ser. No. 765,379
Claims priority, application Japan, Apr. 28, 1976, 51-47847
Int. Cl.² F02M *7/00*
U.S. Cl. 123—32 EE **11 Claims**

1. A fuel supply system for use in an internal combustion engine, said system comprising:
- means for supplying to the engine a fuel mixture charge of increased air fuel ratio, as compared with the stoichiometric air fuel ratio, when the engine is in a low load running mode;
- an injection valve for adjusting the flow rate of fuel to be supplied to the engine;
- first means for detecting the air fuel ratio of exhaust products from the engine;
- second means for computing the flow rate of fuel to be supplied to the engine to produce a fuel mixture charge of stoichiometric air fuel ratio and for feeding an output to the injection valve;
- third means for generating an output in accordance with the position of a throttle valve in an intake manifold;
- fourth means for integrating the output of said third means;
- fifth means for comparing an output of said fourth means with a reference signal;
- sixth means for switching an output of said second means into an output corresponding to an air fuel ratio larger than the stoichiometric air fuel ratio in association with outputs of said third means and said fifth means;
- said sixth means comprises a seventh means for logically producing an output of said third means and an output of said fifth means; and



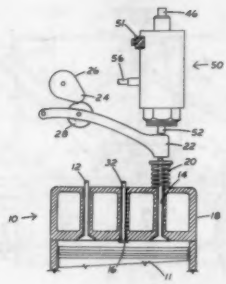
- eighth means for switching from one resistor to another in association with an output of said seventh means; and
- said second means comprises:
  - a basic air fuel ratio setting circuit for computing the flow rate of fuel to be supplied to produce a fuel mixture charge equal to or larger than the stoichiometric air fuel ratio in association with an output of said eighth means, and
  - an air fuel ratio compensating circuit for compensating an output of said basic air fuel ratio setting circuit by said first means in association with said seventh means or for interrupting compensation upon feeding an output to said injection valve.

4,158,348

SYSTEM FOR RETARDING ENGINE SPEED

Lloyd R. Mason, P.O. Box 224, Boonville, Calif. 95414, and Oscar C. Smith, 450 Crestview Dr., Ukiah, Calif. 95482

Filed Jun. 30, 1977, Ser. No. 811,636
Int. Cl.² F02D *13/04*
U.S. Cl. 123—97 B **6 Claims**



1. For use in an internal combustion engine including:
- a cylinder;
- a piston reciprocable in said cylinder;
- a fuel nozzle opening into said cylinder;
- an exhaust valve in said cylinder;

a pump for delivering a quantity of fluid from an outlet timed to jet from said nozzle when said piston is near the end of its compression stroke; and

cam means for opening said exhaust valve after said piston has completed its power stroke;

an engine retarding system comprising:

a pressure fluid-operated actuator for opening said exhaust valve;

a pressure line for delivering fluid to said actuator;

a bypass valve connected to the outlet of said pump and operative in a first position to deliver fluid to said fuel nozzle and in a second position to deliver fluid to said pressure line; and

means operative to move said bypass valve selectively to one of said first and second positions.

4,158,349

IGNITION TIMING CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

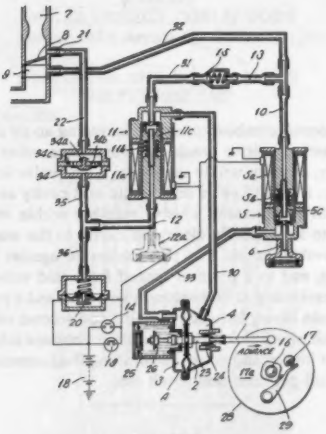
Osamu Goto, Kurume; Masso Watanabe, Asaka, and Yoshio Kadoshima, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1976, Ser. No. 748,660

Claims priority, application Japan, Dec. 11, 1975, 50/166289

Int. Cl.[2] F02P *5/10*

U.S. Cl. 123—117 A **2 Claims**



1. For use with an internal combustion spark ignition engine for driving a vehicle, the engine having an intake passage provided with a throttle valve, an ignition timing control apparatus for the engine comprising, in combination: a timing adjustment mechanism, an actuator assembly for operating said mechanism, said actuator assembly including a first vacuum chamber formed on one side of a flexible diaphragm and a second vacuum chamber formed on the other side of said diaphragm, means for connecting said diaphragm to operate said timing adjustment mechanism, means including a vacuum passage for connecting each of said vacuum chambers to said engine intake passage downstream from said throttle valve, the latter said means including a first control valve for said first vacuum chamber and a second control valve for said second vacuum chamber, each control valve being movable from a position venting its respective vacuum chamber to a second position connecting that vacuum chamber to said vacuum passage, means including electrical switch means for energizing both of said control valves to apply vacuum pressure to said first chamber and to vent said second chamber, and thereby advance the ignition timing, and a first check valve operatively interposed between said first control valve and said vacuum passage to maintain vacuum intensity in said first chamber, said first control valve being further defined as communicating with said engine intake passage upstream from said throttle valve through a second vacuum passage, a second check valve in said second passage, a cruise switch closed by suction pressure in said second vacuum passage, said cruise switch constituting a part of said electrical switch means.

4,158,350

APPARATUS FOR SYSTEM CONTROL, ESPECIALLY IGNITION TIMING OF INTERNAL COMBUSTION ENGINES

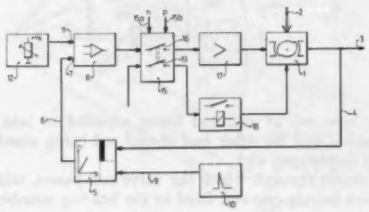
Heinz Möller, and Josef Wahl, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 3, 1977, Ser. No. 793,323

Claims priority, application Fed. Rep. of Germany, May 7, 1976, 2620182

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 R **12 Claims**



1. A control apparatus for controlling the operation of a system in which a main system variable depends on the magnitude of at least one of a plurality of other variables, comprising:

final operating means for changing the magnitude of said main variable;

set point generator means for generating a single set point signal associated with a specific set of magnitudes of said other variables;

a feedback control loop for comparing the magnitude of said main variable with said single set point signal including means for engaging said final operating means;

means for detecting the occurrence of a specific set of magnitudes of said other variables and for then closing said feedback control loop causing actuation of said final operating means and adjustment of said main variable to correspond to said single set point signal; and

means for opening said feedback control loop upon cessation of occurrence of said specific set of magnitudes of said other variables to thereby return the system to direct operation without feedback.

4,158,351

FLOW CONTROL VALVE FOR AN EXHAUST GAS RECIRCULATION APPARATUS OF AN EXHAUST GAS PRESSURE CONTROL TYPE

Masahisa Ando, Aichi; Keigo Kato, Toyota; Masami Yamazaki, Toyokawa, and Yosio Kuroiwa, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 4, 1977, Ser. No. 774,472

Claims priority, application Japan, Dec. 14, 1976, 51/149341

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **3 Claims**

1. In an exhaust gas recirculation system for an internal combustion engine which includes an exhaust gas recirculation passageway connecting the exhaust system of the engine with the intake system of the engine, pressure control means for controlling the pressure of exhaust gas to be recirculated through said passageway, the improvement that comprises:

a body having an exhaust gas chamber which forms a part of said exhaust gas recirculation passageway, said body hav-

ing a cylindrical recess on one side thereof to form a partition between the chamber and the recess,

a valve seat located in said chamber;

a valve member facing said valve seat;

a vacuum actuator means mounted on said one side of said body and having a spring-urged diaphragm, to which diaphragm a vacuum force in the engine intake system is applied;

a bearing member secured to said cylindrical recess;

a valve rod extending transversely to said bearing member and said partition, said rod freely passing through the partition and slidably passing through the bearing member, one end of said rod being attached to said valve member, and the other end of said rod being attached to said diaphragm; and

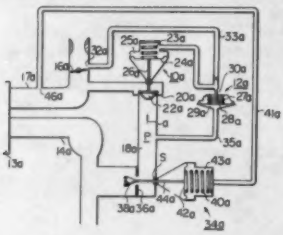


plate means through which the valve rod passes, said plate means having one end fixed to the bearing member, said plate means on the other end thereof being resiliently pressed to said partition, whereby exhaust gas leaked to a clearance between said rod and said partition is prevented from reaching said bearing member, and said leaked gas is introduced, under a suctional force formed in the intake system, into an exhaust gas by-pass conduit formed in said body, which conduit being connected to said exhaust gas recirculation passageway located near said intake system.

4,158,352

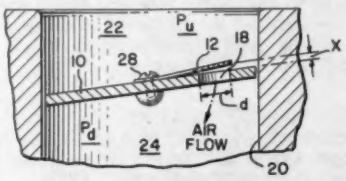
APPARATUS FOR PROVIDING ADDITIONAL AIR TO AID STARTING OF I.C. ENGINES

Albert Blatter, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 30, 1977, Ser. No. 838,192

Int. Cl.² F02M 7/12

U.S. Cl. 123—119 DB **3 Claims**



1. A throttle valve control for providing additional air to the cylinders of an internal combustion engine during cranking of the engine comprising:

a throttle body including means forming a bore;

a throttle blade disposed in said throttle body bore for controlling the supply of air to the engine and having means thereon forming an aperture hole through said blade; and

valve means movably secured relative to said throttle blade, said valve means having a normally open position and a closed position and being operative to change between said open and closed positions in response to a pressure differential across said throttle blade, said open position permitting air flow through said hole into the intake manifold and entrain fuel in said air flow during cranking of the engine, and precluding air from flowing through said hole upon starting of the engine when the manifold pressure reduces from ambient pressure to move said valve means to the closed position.

4,158,353

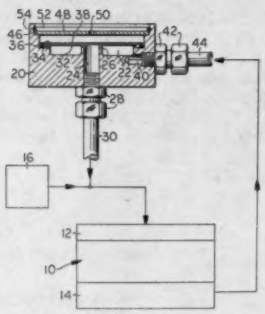
POSITIVE CRANK CASE VENTILATION VALVE AND INTERNAL COMBUSTION ENGINE INCLUDING THE SAME

William E. Darnell, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Continuation of Ser. No. 670,923, Mar. 26, 1976, abandoned. This application Oct. 21, 1977, Ser. No. 844,148

Int. Cl.² F02M 25/06

U.S. Cl. 123—119 B **8 Claims**



1. An internal combustion engine including an air intake and a crank case, a positive crank case ventilation valve having a valve body, a cavity within said body, a first valve seat within said cavity, a second valve seat within said cavity and smaller than said first valve seat, a valve member within said cavity and sized to substantially close said cavity to the ambient and yet be movable therein to a position seated against both said valve seats, and to a position spaced from said valve seats, a passage terminating at said second valve seat, and a port terminating in said cavity between said first and second valve seats; means establishing fluid communication between said passage and said air intake; and means establishing fluid communication between said port and said crank case.

4,158,354

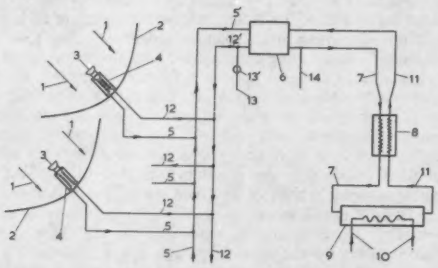
SOLAR ENERGY COLLECTION SYSTEM

Peter O. Carden, Canberra, Australia, assignor to The Energy Research Foundation, Australia

Continuation-in-part of Ser. No. 618,633, Oct. 1, 1975, abandoned. This application May 23, 1977, Ser. No. 799,234

Int. Cl.² F25D 5/00; F24J 3/02

U.S. Cl. 126—270 **17 Claims**



1. A solar energy collection system in which a fluid dissoci-

ates endothermically and subsequently recombines exothermically into an undissociated fluid, comprising

(a) means for introducing said undissociated fluid at elevated temperature, into an absorber-reaction vessel,

(b) means for focussing solar radiation onto the absorber-reaction vessel,

(c) means operable from a master control for controlling the orientation of the means for focussing solar radiation,

(d) means for conducting the fluid from the absorber-reaction vessel through a first counterflow heat exchanger to effect cooling,

(e) means for conducting the fluid to a reaction chamber wherein partial recombining of the dissociated products occurs with release of heat energy,

(f) a separator for separating undissociated fluid and dissociated fluid,

(g) means for returning dissociated fluid to the reaction chamber,

(h) means for returning undissociated fluid to the first heat exchanger so as to heat it prior to entry into the absorber-reaction vessel,

(i) means for maintaining the fluid at superatmospheric pressure,

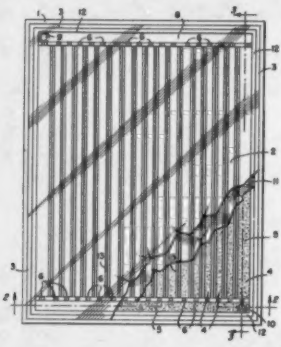
(j) means for recovering heat energy from the reaction chamber.

4,158,355

SOLAR ENERGY COLLECTORS

Hermann J. Spitzer, 8004 Arcade St., Lorton, Fairfax County, Va. 22079

Filed Oct. 14, 1976, Ser. No. 732,696
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **6 Claims**



1. A solar collector for radiant energy exposure of a selected fluid medium having a high radiation absorption coefficient in a low pressure, moving fluid medium, energy transfer system comprising:

an elongated input manifold means;

an elongated output manifold means;

a plurality of parallel fluid medium channels, said channels disposed in parallel and in planar alignment and disposed to interconnect said input manifold means and said output manifold means, said channels having a substantially uniform length and a substantially identical internal cross section, each of said channels having a substantially uniform internal cross section along its length with a determined planar depth internal dimension, said channels transversely oriented to said input manifold means and to said output manifold means such that said elongated input and output manifold means are disposed along the respective lengths thereof in the plane of said plurality of parallel channels;

said input manifold means and said output manifold means including fluid medium input means and fluid medium output means, respectively, each of said input means and said output means disposed and adapted to produce an equibalanced pressure differential across said plurality of parallel channels;

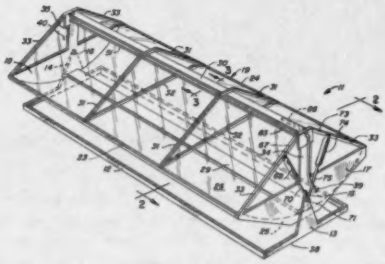
said planar depth internal dimension of said channels being inversely proportional, for any given radiant energy intensity, to the radiation absorption coefficient of said fluid medium.

4,158,356

SELF-POWERED TRACKING SOLAR COLLECTOR

David V. Wininger, P. O. Box 337 606 Bjornsen, Big Rapids, Mich. 49307

Filed Feb. 22, 1977, Ser. No. 770,674
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **16 Claims**



1. A solar collector comprising:

(a) focusing means, including a reflective concave surface with cylindrical symmetry and, on a cross section perpendicular to an axis of said cylindrical symmetry said reflective surface having, the shape of a parabola, for concentrating at a first area at least part of the solar radiation striking a second area;

(b) transducer means, having a constant orientation relative to said reflective surface and located, at least in part, in proximity to the focal line of said parabola, for receiving concentrated solar radiation at said first area and converting the energy in said concentrated solar radiation to a form usable in a location remote from both said first area and said transducer means;

(c) support means coupled to said focusing means and said transducer means for holding said focusing means and said transducer means at one of a plurality of different orientations relative to the earth; and

(d) solar-powered orienting means for increasing the amount of solar radiation reflected by said focusing means onto said first area, said orienting means including:

(1) collector means coupled to said focusing means for receiving solar radiation reflected from said focusing means when, at any particular time, said transducer means receives substantially less than the maximum amount of solar radiation obtainable from said focusing means, said collector means including two portions, the first of said portions being located on one side of the axial plane of said cylindrically symmetric parabola and the second of said portions being located on the other side of said axial plane; and

(2) converting means coupled to said support means, said collector means, and said focusing means for changing the orientation of either said focusing means or said transducer means relative to the earth in a direction to increase the amount of solar radiation received from said focusing means by said transducer means, the energy required for changing said orientation being provided from the solar radiation received by said collector means, said first or second portions of said collector means, when receiving greater solar radiation than the other, energizing said converting means to change the

orientation of said focusing and said transducer means in a direction to equalize the solar radiation striking said first and second portions.

4,158,357

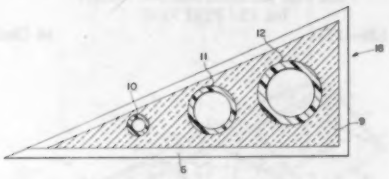
INNER ROOF SOLAR SYSTEM

Joseph Allegro, 377 Ellamar Rd., West Palm Beach, Fla. 33405

Continuation-in-part of Ser. No. 809,361, Jun. 24, 1977. This application Dec. 16, 1977, Ser. No. 861,450

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 **2 Claims**



1. A solar heated liquid section unit comprising in combination,

an insulated exterior roof facing, and

a plurality of pipes extending throughout the interior of the facing for circulating solar heated liquid therethrough to transfer solar generated heat from said roof facing, wherein said roof facing includes a solid heat conductor body comprising silica sand filler held by a resin embodying the sand filler as a fireproofing additive and heat conductor.

4,158,358

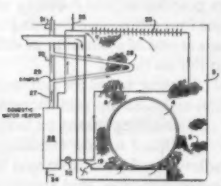
HEAT AND COLD STORAGE APPARATUS

Harry E. Thomason, and Harry J. L. Thomason, both of 609 Cedar Ave., Washington, D.C. 20022

Division of Ser. No. 480,752, Jun. 19, 1974, Pat. No. 4,029,082. This application Jun. 7, 1977, Ser. No. 804,351

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—400 **2 Claims**



1. Heat storage bin apparatus and auxiliary heat apparatus comprising heat storage material in an insulated compartment having means to receive heat from an outside source and store it for use at a later time, combustion apparatus having a first flue pipe means for transporting products of combustion to a point outside of said heat storage bin, passing, in transit, in heat-exchange relationship with said storage bin to warm the air or other contents thereof at certain times, second flue pipe means to transport said products of combustion to a point outside of said heat storage bin substantially in non-heat-exchange relationship with said storage bin to avoid warming the air or other contents thereof during other periods of time, and means to direct the flue gasses through one of said flue pipes, or through the other.

4,158,359

DEVICE FOR TESTING INFLUENCE OF MEDICINAL OR COSMETIC SUBSTANCE ON SKIN

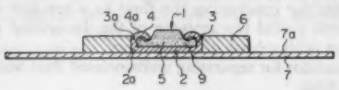
Masahiro Kurokawa, and Hisao Iwamoto, both of Odawara, Japan, assignors to Kanebo Limited, Tokyo, Japan

Filed Jan. 19, 1978, Ser. No. 870,922

Claims priority, application Japan, Jan. 24, 1977, 52-006243[U]; Dec. 28, 1977, 52-175958[U]

Int. Cl.[2] A61B *10/00*

U.S. Cl. 128—630 **10 Claims**



1. A device for testing the influence of a medicinal or cosmetic substance on skin, comprising:

a tray having a bottom, a periphery side wall extending from the bottom, by which bottom and side wall an inside space for containing a medicinal or cosmetic substance to be tested is defined, and an annular sealing member laterally extending from the top end of the side wall;

a porous protecting sheet having at least one hole formed therein, in which hole the tray is contained, and;

a covering sheet having an adhesive surface onto which the outside surface of the bottom of the tray and a lower surface of the protecting sheet are adhered.

4,158,360

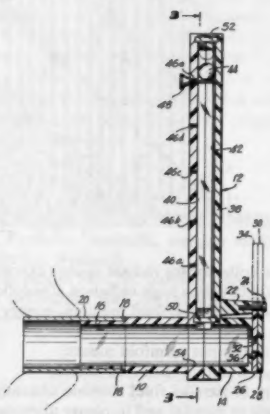
EXPIRATORY FLOW METER

Jim M. Adams, Mt. Pleasant, S.C., assignor to Projects in Health, Inc., Princeton, N.J.

Filed Jan. 26, 1978, Ser. No. 872,698

Int. Cl.[2] A61B *5/08*

U.S. Cl. 128—725 **9 Claims**



1. A peak expiratory flow metering device for measuring airway obstruction in a patient indicating the necessity of more definitive testing comprising a mouthpiece, an elongated channel substantially perpendicular to said mouthpiece, an orifice member disposed substantially inline with said mouthpiece and defining a first orifice therein, a float located within said channel and for motion within said channel, said channel and orifice member in flow communication with said mouthpiece whereby said motion occurs in response to expiration from said patient, a plurality of channel openings defined by said channel at various points along said channel, means for preventing downward motion of said float within said channel including a

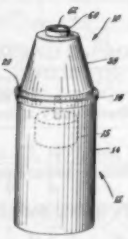
removable pin positionable within said channel openings and means for selectively lessening said first orifice.

4,158,361

DISPENSING SYSTEM FOR DIRECTING LIQUID TO A DEFINED AREA

Paul M. Kotuby, Naugatuck, Conn., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.

Filed Sep. 29, 1977, Ser. No. 837,813
Int. Cl.[2] A61M *11/00*
U.S. Cl. 128—173 R 5 Claims



1. In a liquid dispensing package including a container and means for forcing the liquid from the container, a dispensing system for directing liquid forced from the container to a defined area such as the eye and comprising:

A. a nozzle, operatively connected to said means for forcing liquid from said container, movable between a liquid dispensing position depressed toward said container and a closed position returned away therefrom, and having an outlet orifice for dispensing liquid therethrough when said nozzle is depressed to said liquid dispensing position;

B. an overcap, mounted with said container in a fixed axial position relative thereto, defining an opening registerable with said outlet orifice when said nozzle is moved to said liquid-dispensing position; and

C. a shield both mountable with said container to enclose and protect said nozzle and said overcap when said package is not in use and mountable with said overcap to direct liquid dispensed through said outlet orifice of said nozzle and said overcap opening to said defined area when said nozzle is depressed to said liquid dispensing position, said shield comprising a generally frustoconical member having a tubular boss, defining an inlet aperture, shaped and sized to be removably press fitted into said overcap opening, said shield thereby being mountable in a fixed position relative to said overcap and thus said container, and said member further defining an outlet aperture, relatively larger than said inlet aperture, shaped and sized to engage said defined area when said shield is mounted with said overcap as aforesaid and to engage the container in the region of said nozzle and overcap thereby being mountable with said container to protect said nozzle and overcap as aforesaid,

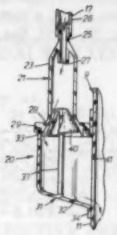
whereby said nozzle may be depressed to said liquid dispensing position when said shield is mounted with said overcap without disturbing the fixed positional relationship between said shield, said overcap and said container.

4,158,362

UNIDIRECTIONALLY VALVED DRIP CHAMBER, INLET PORT ASSEMBLY USEFUL FOR LIQUID COLLECTION CONTAINERS

Andrew M. Durrett, Libertyville, and Kenneth E. Pawlak, Mundelein, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 23, 1977, Ser. No. 827,391
Int. Cl.[2] A61J *1/00*; A61F *5/44*
U.S. Cl. 128—272 15 Claims



1. A drip chamber, inlet port assembly comprising:

a housing having an inlet for the entrance of liquid into said housing, an outlet for the exit of liquid from said housing, and a substantially frusto-conical portion positioned between said inlet and outlet and forming a valve seat; and

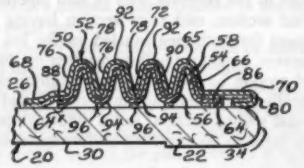
a flexible, hollow, substantially frusto-conical unidirectional valve fixedly mounted, on means therefor, in said housing complementary to and centered within said valve seat so that the conical surface of said valve is normally positioned against said valve seat, said valve having its top closed and its bottom open, whereby liquid flowing from said inlet towards said outlet forces said conical surface of said valve to flex away from said valve seat so that said valve is opened, while liquid flowing from said outlet towards said inlet forces said conical surface of said valve more firmly against said valve seat so that said valve remains closed to such reverse flow.

4,158,363

DIAPER WITH EXTENSIBLE FASTENER

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 752,495, Dec. 20, 1976, abandoned.
This application Feb. 22, 1978, Ser. No. 880,260
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—287 6 Claims



3. A disposable diaper, comprising:

an absorbent pad assembly having a pair of opposed surfaces, and a side edge; and

a tape fastener comprising, a pressure-sensitive tape strip having a first portion attached to one of said surfaces of the pad assembly, a securement portion remote the first portion, and an extensible central portion extending between the first and securement portions, said fastener having a release sheet having a first end attached to said one surface of the pad assembly adjacent said side edge, a second end attached to the diaper adjacent said first strip portion, and an outer release surface, with adhesive on

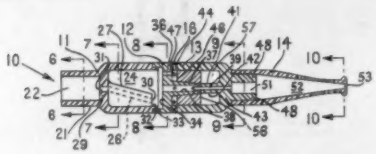
said central strip portion being releasably attached to the release surface of the release sheet intermediate said first and second ends, and said central strip portion and attached release sheet having at least one lateral fold at a location intermediate the first and second ends of the release sheet.

4,158,364

TOBACCO SMOKE FILTER

Enrique Ligeti, Pleasanton, Calif., assignor to Albert P. Marinko, Pleasanton, Calif., a part interest

Filed Sep. 22, 1977, Ser. No. 835,696
Int. Cl.[2] A24F *13/02, 13/04*
U.S. Cl. 131—187 **5 Claims**



1. A tobacco smoke filter comprising an assembly of a plurality of detachably connected sections; said assembly consisting of a first section for holding a burning cigarette and for passing inhaled tobacco smoke, said first section comprising a u-shaped structure having a pair of inturned slanting flanges arranged in confronting relationship to define an inclined restricted bore through which inhaled tobacco smoke is drawn from a restricted opening leading from an expanded smoke inlet to said restricted bore which terminates adjacent a side wall of said first section to open into a second expanded chamber of said first section, a second section removably attached to said first section; said second section comprising two parts of which one part consists of a transverse web having a restricted passageway therethrough adjacent to one side thereof and communicating at its one end with said second expanded chamber of said first section, and the other part of section two consists of a connected tapering element having a tapering bore therethrough for conducting the inhaled smoke, said second section having an annular flange thereon, having an opening therein leading to the exterior thereof to admit air into the interior thereof, a third section detachably and rotatably connected to said second section; said third section having an annular inner shoulder having a series of spaced apart radially extending passages of different cross-sections therein which are adapted to be selectively placed in communication with said opening of said annular flange of said second section to conduct air from the exterior to the tapering bore of said tapering element of said second section; said third section having an expanded compartment for gathering inhaled smoke led through said second section, a reduced hollow member on the outer end of said third section having its defined slightly expanded bore communicating with said tapering bore of said tapering element of said second section, and a mouth-piece section telescopically fitted to said reduced hollow member of said third section.

4,158,365

TANK CLEANING APPARATUS

Grady Watts, 50 Sintsink Dr. East, Port Washington, N.Y. 11050

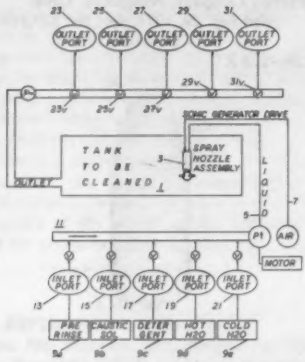
Filed Apr. 5, 1978, Ser. No. 893,701
Int. Cl.[2] B08B *3/02, 9/08*
U.S. Cl. 134—113 **4 Claims**

1. In the cleaning of tanks by inserting a spray nozzle assembly (3) through an aperture in the top of the tank and feeding cleaning liquids to the spray nozzle assembly, which liquids are sprayed into the tank, an apparatus having a compact spray nozzle feed arrangement for feeding different liquids to said spray nozzle assembly and means for removing liquids from the tank, comprising, in combination:

(a) a rectangular box-like frame having a top, bottom, front, rear and longitudinal sides defined therein;

(b) a plurality of inlet ports (13–21) connectable to a plurality of sources of different cleaning liquids and a corresponding number of outlet ports (23–31) at said rear, said inlet ports being aligned towards said bottom and said outlet ports being aligned towards said top, each port being color coded to signify a liquid and, air actuated valves for controlling each of said ports;

(c) a first trunk line (37) towards said rear extending from about one longitudinal side to the other longitudinal side fed by all inlet port valves, a pump (33) fed by said first trunk line for pumping liquid to a high pressure line (35) which feeds the liquid to a spray nozzle of the spray nozzle assembly;



(d) a return port (47) in one of said frame longitudinal sides near the front, a return pump (43) having an inlet connectable to the tank being cleaned and an outlet connected to said return port to feed liquid removed from the tank to said return port, and, a return trunk line (49) connected to said return port;

(e) a diverter (51) coupled to said return trunk line (49) including strain means therein for filtering returned liquid, a plurality of outlet lines (23*a*–31*a*) coupled to said diverter, said outlet lines being in turn connected to said outlet port valves thereby feeding returned liquid to said outlet ports; and,

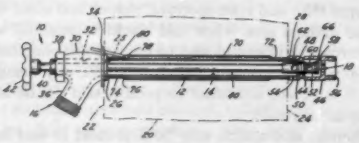
(f) a front panel at said front including pneumatic actuator means connected to said valves for controlling connection of a selected one of said inlet ports to said first trunk line and a selected one of said outlet ports to said return trunk line.

4,158,366

SILLCOCK WITH WATER RELIEF SYSTEM

Chester J. Van Meter, Rte. 2, Box 53, Sapulpa, Okla. 74066

Filed Jul. 27, 1977, Ser. No. 819,288
Int. Cl.[2] F16K *37/00*; F16L *5/00*
U.S. Cl. 137—312 **5 Claims**



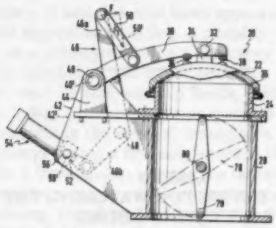
1. A frostproof sillcock comprising an inner elongated tubular pipe having a water-flow passage therein and adapted to

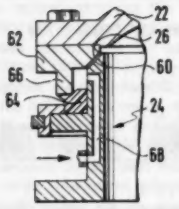
extend through a building wall, a spout and a water regulating handle means assembly connected to the outer end of said inner tubular pipe and having a water-flow passage communicating with the water-flow passage in said inner tubular pipe, a valve means assembly connected to the inner end of said inner tubular pipe, an elongated valve stem within said inner tubular pipe and in coaxial alignment therewith, said valve stem having one end thereof secured to the valve of said valve means assembly and the other end connected to the handle of said regulating handle means assembly, and an outer elongated tubular pipe concentric with said inner tubular pipe and spaced therefrom throughout substantially the entire length thereof, said inner and outer tubular pipes forming a water relief flow chamber for water escaping through an opening in the wall of said inner tubular pipe upon the rupture thereof, said relief flow chamber being provided with a discharge element which is opened to the atmosphere to permit the water to be discharged from said relief flow chamber, said discharge element having one end portion extending through and being carried by said outer elongated tubular pipe and the other end thereof terminating adjacent said handle means.

4,158,367
VALVE SYSTEM AND IMPROVED ACTUATOR THEREFOR

Pierre H. Mailliet, Howald, Luxembourg, assignor to S.A. des Anciens Etablissements Paul Wurth, Luxembourg, Luxembourg

Filed Mar. 23, 1977, Ser. No. 780,689
Claims priority, application Luxembourg, Apr. 12, 1976, 74745
Int. Cl.² F16K *31/16, 49/00, 1/42*
U.S. Cl. 137—340 **29 Claims**





1. In a system for controlling the flow of gas between the interior of an enclosure and the ambient atmosphere via a conduit having an axis, the system including a valve comprising a movable valve member having a sealing surface which cooperates with a stationary valve seat, an improved actuating mechanism for the valve member comprising:

an elongated movable valve support member, said support member being connected to the valve member and being pivotal about an axis which is displaced from the point of connection of the support member to the valve member;

means for producing a valve actuation force;

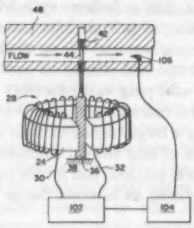
lever means pivotable about an axis lying in a plane perpendicular to a plane in which the axis of the conduit lies, a first end of said lever means being coupled to said force producing means; and

connecting rod means, said connecting rod means coupling the second end of said lever means to said support member intermediate the ends of said support member, said force producing means providing for the pivoting of said lever means to thereby transmit a valve actuation force via said connecting rod means to said support member to pivot said support member and the valve member between a position where the sealing surface of the valve member cooperates with the valve seat to prevent fluid flow through the conduit and a position where the valve member is completely removed from registration with the conduit.

4,158,368
MAGNETOSTRICTIVE TRANSDUCER

Arthur E. Clark, Adelphi, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 12, 1976, Ser. No. 685,867
Int. Cl.² F16K *31/04*
U.S. Cl. 137—487.5 **18 Claims**



1. A magnetostrictive valve for control of the flow of fluids, comprising:

a conduit having a passageway for flow;

means for varying the amount of flow within the passageway, including a plate slidably disposed transversely to the conduit and having at least one aperture positionable in communication with the passageway;

means for producing a magnetic field;

magnetostrictive control means external to the conduit and isolated from the flow;

the control means being made from one or more alloys of iron and one or more rare earth metals;

connecting means to interconnect said magnetostrictive control means means to the flow varying means,

whereupon producing a magnetic field about the magnetostrictive control means, the plate aperture is adjusted with respect to the passageway thereby controlling the flow of fluids through the conduit,

feedback control means adapted to adjust the magnetic field about the magnetostrictive control means;

a flow sensor adapted to generate an output value representative of the actual flow through the conduit; and

immobile flow comparator means to compare a value representative of a desired flow through the conduit with said output value to produce a signal to regulate said feedback control means,

whereby the plate aperture is adjusted with respect to the passage to establish and maintain a desired flow through the passageway.

4,158,369

HOLD-BACK VALVE FOR SINGLE RELEASE AIR BRAKES

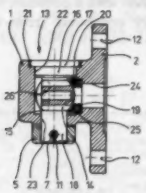
Thomas Störzinger, Munich; Erich Langer, Puchheim, and Peter Pick, Munich, all of Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 26, 1977, Ser. No. 828,042

Claims priority, application Fed. Rep. of Germany, May 12, 1977, 2721331

Int. Cl.² F16K 3/22

U.S. Cl. 137—599.2 30 Claims



1. A hold-back valve for single release air brakes comprising a valve body having a chamber therein and air inlet and air outlet passages opening to said chamber, a plug valve member having passage means therethrough disposed in said chamber and rotatable between at least two positions to define paths of different resistance to flow between said air inlet and outlet, said plug having a central portion shaped as a sphere having a flattened surface, and a hollow cylindrical flexible packing around the opening of said air inlet passage to said chamber, said packing having one end facing toward said plug central portion and said one end shaped to conform to the spherical surface thereof, said plug valve member comprising first and second cylindrical extensions on said central portion, said first extension having a larger diameter than said second extension and the diameter of said second extension being smaller than that of said central portion, and means on the end of said first extension for defining an external flange thereon.

4,158,370

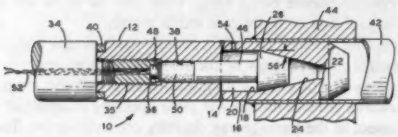
EXPLOSIVE ACTIVATED PLUG

Gordon C. Larson, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Jun. 9, 1978, Ser. No. 914,097

Int. Cl.² F16L 55/12

U.S. Cl. 138—89 5 Claims



1. An explosive-activated plug for mechanically sealing a tube comprising an expansion sleeve open at one end and closed at the other end and having a partially tapered internal cross section, a hardened tubular explosive case joined to the open-ended portion of the sleeve, a frusto-conical piston disposed within the sleeve and in contiguous contact with the interior walls thereof, an extension member detachably affixed to the case, explosive means disposed within the case and operable from a location outside thereof to cause the piston to expand the sleeve against the surrounding tube surface to effectuate a leak-proof seal therewith.

4,158,371

ASPHALT AND RUBBER COMPRISING COMPOSITION

Robert E. Reusser; Lew T. Gray, and Oren L. Marrs, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 777,216, Mar. 14, 1977, Pat. No. 4,115,335. This application Dec. 23, 1977, Ser. No. 864,124

Int. Cl.² F16L 9/14; B05D 3/02

U.S. Cl. 138—145 22 Claims

1. A pipe consisting essentially of a base pipe and a coating, said coating in turn consisting essentially of

a. about 50 to 70 wt. % of a mineral aggregate,

b. about 15 to 35 wt. % of a finely divided mineral filler,

c. about 5 to 20 wt. % of asphalt,

d. about 0.05 to 7 wt. % of a rubbery radial teleblock copolymer,

e. about 0 to 7 wt. % of oil,

f. about 0 to 0.5 wt. % of a fibrous material.

11. A process for coating a pipe comprising

a. mixing the following ingredients to form a fluid composition;

about 50 to 70 wt. % of a mineral aggregate,

about 15 to 35 wt. % of a finely divided mineral filler,

about 5 to 20 wt. % of asphalt,

about 0.05 to 7 wt. % of a rubbery radial teleblock copolymer,

about 0 to 7 wt. % of oil,

about 0 to 0.5 wt. % of a fibrous material,

b. applying such fluid composition to the external surface of a pipe,

c. letting the composition harden on said pipe to form a solid coating.

4,158,372

PROCESS AND DEVICE FOR WATCHING THE WEFT ON WEAVING LOOMS

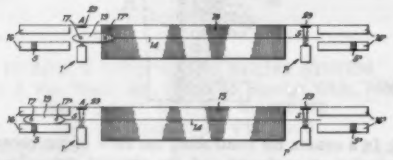
Frans S. Van Dijck, Langemark, Belgium, assignor to N.V. Weefautomaten Picanol, Ieper, Belgium

Filed Mar. 18, 1977, Ser. No. 778,969

Claims priority, application Netherlands, Mar. 29, 1976, 7603258

Int. Cl.² D03D 51/34

U.S. Cl. 139—370.1 4 Claims



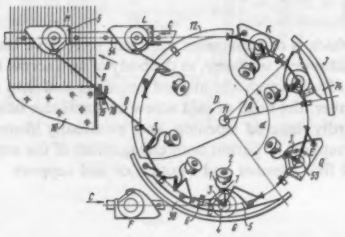
1. The process for watching the weft thread of weaving looms, comprising the steps of: generating a stop signal for the weaving loom in response to the weft carrier leaving the shed; checking for the presence of the weft thread behind the weft carrying means, just outside the shed, and cancelling aforesaid stop signal if thread is present, and causing said stop signal to stop the loom if thread is absent; said stop signal being produced by an optical emitter-receiver and a reflector, one of which is fitted to the race board and the other on the frame, a pencil of light of which is interrupted by the weft carrier.

4,158,373

METHOD OF AND APPARATUS FOR THREADING THE WEFT THREAD CARRIERS IN TRAVELLING-WAVE LOOMS

Eduard A. Onikov; Alexandr L. Galperin; Alexandr A. Zabotin, all of Moscow; Evgeny D. Loschilin, Moskovskaya oblast, Domodedovo, and Nikolai I. Kolobanov, Moscow, all of U.S.S.R., assignors to Tsentralny Nauchno-Issledovatelsky Institut Khlopchatobumazhnoi Promyshlennosti and Nuovo Pignone, Divisione Smit, both of, U.S.S.R.

Continuation-in-part of Ser. No. 724,762, Sep. 20, 1976, abandoned. This application Nov. 28, 1977, Ser. No. 855,297
Int. Cl.[2] D03D *47/26*
U.S. Cl. 139—436 6 Claims



1. A method of threading spools of weft thread carriers in a travelling-wave loom apparatus, said loom apparatus including a substantially horizontally extending rotatable disk, said disk having a plurality of thread wound bobbins and a plurality of winding heads associated therewith, the winding heads including a plurality of threadguides rotatably mounted proximate to the periphery of said disk said loom apparatus further including carrier apparatus including a plurality of carrier spools mounted on a conveyor having a trajectory adapted to carry each of the spools into and out of operative engagement with respective ones of said winding heads, said loom apparatus further including a looming-up zone spaced from said disk, said method comprising the steps of: arranging a thread on a bobbin, said thread having a free end; inserting the free end of the thread into a threadguide; nipping the thread free end with a grip; conveying a carrier spool into association with a threadguide; rotating the thread-guide around the carrier spool, while maintaining the spool rotatably stationary, whereby the thread is unwound from the bobbin and wound onto the said carrier spool in the form of coils; inserting the weft thread into a thread tensioner associated with the carrier spool while the last coil thereof is wound; gripping this thread in the thread tensioner; conveying the carrier spool out of association with the threadguide and introducing the carrier spool together with the gripped thread into the looming-up zone while maintaining said threadguide in a nonrotatable mode; unwinding the weft thread from the bobbin as a result of the departure of the threadguide from the carrier spool and the maintenance of the threadguide in a nonrotatable mode, with simultaneous formation of a straight section of the weft thread; introducing the thread into a grip with subsequent gripping thereof; severing the coils of the weft thread on the carrier spool from the straight section thereof with formation of a free end of the thread at the grip for successive threading of a next carrier spool with the weft thread.

4,158,374

MEASURING DISPENSER

Salvatore D. Ciuffetti, Fitchburg, Mass., assignor to Product Development Associates, Pocasset, Mass.

Filed Jan. 16, 1978, Ser. No. 869,952
Int. Cl.[2] G01F *11/10*
U.S. Cl. 141—392 9 Claims

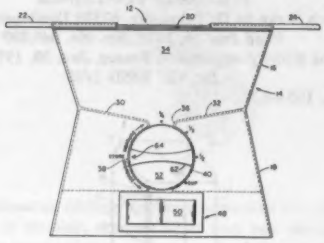
1. A measuring dispenser for flowable material having the combination of

a hopper having an elongate aperture in the bottom thereof,

an elongate sleeve member joined with the hopper and having a pair of longitudinally extending slots in the wall thereof, one of said slots communicating with said aperture and the other slot being located substantially diametrically opposite thereto,

a receptacle alignable with said other slot,

an elongate barrel member rotatable in the sleeve member and comprising a plurality of measuring portions mutally longitudinally displaced along the barrel axis, each portion comprising a single closed-ended recess of predetermined volumetric capacity, the recesses each having an open end in a wall of the barrel member alignable with each of said slots by rotation of the barrel member, said



open ends being mutually angularly displaced about the axis of the barrel member and the volumes of the recesses being such that, by rotation of the barrel member in a filling direction from an initial angular position through less than 360 degrees to a limit angular position, the recesses are aligned sequentially with said aperture in the hopper until all of the recesses are filled, and

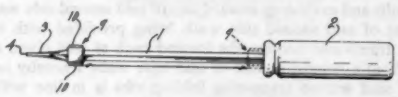
means rotatable with the barrel member for indicating said initial and limit positions and at least one intermediate angular position, wherein a plurality less than all of said recesses are filled by rotation of said barrel member to said intermediate angular position in said filling direction, whereby upon reverse rotation of the barrel member the filled recesses are successively aligned with said other slot and emptied into said receptacle.

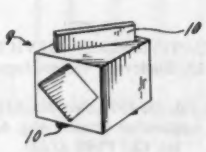
4,158,375

SCREWDRIVER

Roger Cournoyer, 17200 Libby Rd., Maple Heights, Ohio 44137

Filed Feb. 17, 1978, Ser. No. 878,688
Int. Cl.[2] B25B *15/00*
U.S. Cl. 145—50 C 2 Claims





1. A screwdriver comprising a straight shank of non-circular uniform cross-section, a handle secured to one end of said shank, a main screw driving head integrally formed with the

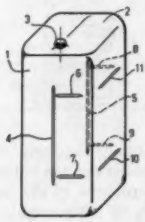
other end of said shank and including a main bit extending co-axially with and outwardly from said shank and an auxiliary screwdriving head comprising a block having a through bore of a cross-sectional shape complementary to the cross-sectional shape of said shank, said auxiliary head slidable along said shank between an operative position adjacent said main head and an inoperative position adjacent said handle, said main head forming an enlargement at said other end of said shank to limit slidable movement of said auxiliary head along said shank, and a pair of auxiliary screwdriving bits integrally formed with said block and laterally projecting from opposite sides of said block and angularly disposed and arranged in parallelism relative to the longitudinal extent of said shank.

4,158,376

FOLDABLE CONTAINER

René Erb, 4 rue du Dr Schneider, 67320 Drulingen, France

Filed Jan. 16, 1978, Ser. No. 869,839
Claims priority, application France, Jan. 20, 1977, 77 01604
Int. Cl.[2] B65D *1/00*
U.S. Cl. 150—0.5 16 Claims



1. A rectangular parallelepiped foldable container made of flexible material and adapted to be introduced into a foldable semi-rigid support and to contain a flowable product comprising two rectangular base walls generally parallel to one another, two rectangular first side walls generally parallel to each other and connected to said base walls, and two rectangular side walls generally parallel to each other and connected to said base walls and to said first side walls, each of said first and second side walls having an inner and an outer surface, one of said base walls having at least one aperture, each one of said first side walls having a folding rib extending longitudinally in the middle of an associated first side wall over at least a portion of the length thereof between said base walls, each first side wall being foldable along its longitudinal rib to fold each first side wall upon itself and to place the interior surfaces of said second side walls into contact with one another, each one of said first side walls further having two first transverse folding ribs generally perpendicular to said longitudinal ribs and located each at a given distance from a respective one of said base walls and extending toward one of said second side walls, said one of said second side walls being provided with two second transverse folding ribs located each at said given distance from a respective one of said base walls whereby each one of said second transverse folding ribs is in line with a corresponding pair of said first transverse folding ribs provided on said two first side walls.

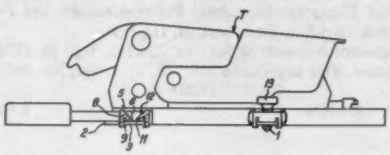
4,158,377

CAPTIVE SCREW DEVICE

Jean J. A. Beyl, 10, Boulevard Victor-Hugo, Nevers, Niévre, France

Filed Jul. 21, 1977, Ser. No. 817,726
Claims priority, application France, Aug. 6, 1976, 76 24029
Int. Cl.[2] F16B *41/00*
U.S. Cl. 151—69 7 Claims

1. A captive screw device for attaching one member having an opening therethrough to a second member, said captive screw device comprising a screw having a head larger than said opening and means supported by said one member holding said screw in alignment with and above the opening in said one member, said means comprising a support formed of pressure-distensible material, notched on one side and having a downwardly tapered central opening therethrough surrounding said screw, the lower end of said tapered opening being of a diameter sufficient to support the body of said screw and the upper



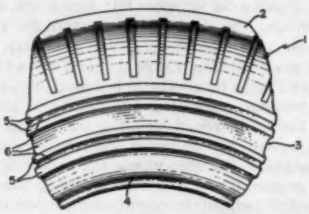
end of which is of a diameter sufficient to receive the headed end of said screw, whereby, as the body of said screw is moved downwardly through the aligned openings and into said second member, the head of said screw contacts the sides of said downwardly tapered opening and eventually distends said notched support to permit both engagement of the screw head with said first member and ejection of said support.

4,158,378

TIRE HAVING POLYURETHANE LAMINATE THEREON

Charles J. Pearson, and Jeffrey W. Saracsan, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 19, 1977, Ser. No. 861,775
Int. Cl.[2] B60C *13/00*
U.S. Cl. 152—353 R 17 Claims

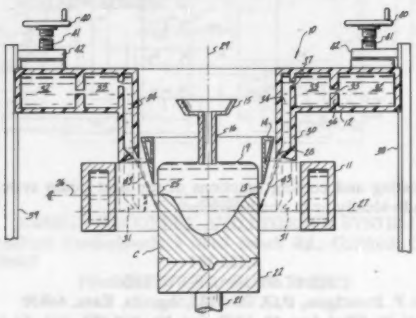


1. A tire which comprises a composite structure of a cured rubber tire having adhered thereto a laminate of a cured polyurethane prepared by (A) applying to a cured rubber tire a solution of a reaction mixture comprised of (i) an aliphatic primary diamine, (ii) a prepolymer prepared by reacting an organic polyisocyanate having an isocyanate functionality in the range of about 2 to about 2.8, with a polycaprolactone polyol having a number average molecular weight in the range of about 2500 to about 3700, and an average hydroxy functionality of about 2, and (iii) about 7 to about 90 weight percent organic solvent based on the total of (i, ii and iii), where the mole ratio of isocyanate groups to hydroxyl groups of the polyol is in the range of about 1/1 to about 3/1, and where the mole ratio of amine groups of the diamine to excess isocyanate groups over the hydroxyl groups is in the range of about 0.8/1 to about 1.2/1, and (B) drying and curing the applied solution of reaction mixture to form the composite structure.

4,158,379
ELECTROMAGNETIC CASTING METHOD AND APPARATUS

John C. Yarwood, Madison; Ik Y. Yun, Orange, and Derek E. Tyler, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 3, 1978, Ser. No. 921,298
Int. Cl.[2] B22D *11/124, 27/02*
U.S. Cl. 164—49 11 Claims



1. In an apparatus for continuously or semicontinuously casting metals comprising:

means for electromagnetically containing molten metal and for forming said molten metal into a desired casting, said electromagnetically containing and forming means including: an inductor for applying a magnetic field to said molten metal; and a non-magnetic screen means for shaping said magnetic field, said screen means being arranged coaxially with said inductor; said apparatus further including means for applying coolant to said casting for solidifying said molten metal, said coolant applying means including a manifold and at least one coolant discharge port connected to said manifold for directing said coolant against said casting; said inductor and said coolant applying means being coaxially arranged about an axis of said casting which defines a desired axial direction; the improvement wherein, said apparatus further includes:

means for controlling the position of a solidification front in said axial direction at a surface of said casting, said means for controlling said position of said solidification front comprising means for adjustably supporting said at least one coolant discharge port for movement in said axial direction between said inductor and said non-magnetic screen means independently of said electromagnetically containing and forming means; whereby the position at which the coolant is applied to said surface of said casting can be adjusted to control the position of said solidification front without modifying said magnetic field.

9. In a method for continuously and semicontinuously casting metals comprising:

electromagnetically containing and forming molten metal into a desired casting, said electromagnetically containing and forming step including the steps of:

providing an inductor for applying a magnetic field to molten metal and providing a non-magnetic screen for shaping said magnetic field; and applying said magnetic field to said molten metal; said method further comprising:

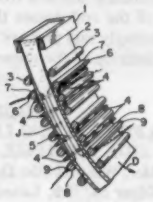
applying coolant to said casting for solidifying said molten metal, said coolant applying step including the step of providing a coolant discharge port for directing said coolant against said casting; and

controlling the position of a solidification front at a surface of said casting, said controlling step including the step of adjusting the position of said coolant discharge port without substantially modifying said magnetic field by moving said discharge port between said non-magnetic screen and said inductor and independently thereof.

4,158,380
CONTINUOUSLY CASTING MACHINE

Kantaro Sasaki, Ashiya; Sumio Kobayashi, Yamatokoriyama; Yasuo Sugitani, Takarazuka, and Susumu Ishimura, Hirakata, all of Japan, assignors to Sumitomo Metal Industries Limited, Osaka, Japan

Filed Feb. 27, 1978, Ser. No. 881,411
Int. Cl.[2] B22D *27/02, 11/00*
U.S. Cl. 164—147 5 Claims

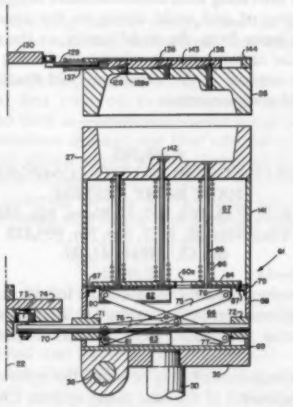


1. In a continuous casting machine, apparatus for stirring molten metal in the slab, comprising at least two permanent magnet groups mounted in spaced opposed relationship to the surfaces of the opposite long sides of the slab and extending from a portion below a casting mold of the casting machine to a completely solidified part of the slab, each of said permanent magnet groups including one or more permanent magnets arranged in the width direction of the slab, the S poles and N poles of the permanent magnets being paired and opposed to the N and S poles of the opposed permanent magnet group through the slab, and brushes for contacting with supporting rolls of the casting machine to provide a flow of direct current in the molten steel within the slab in the slab-drawing direction.

4,158,381
CORE BOX ASSEMBLY

Anatol Michelson, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 784,939, Apr. 5, 1977, Pat. No. 4,083,396.
This application Jan. 23, 1978, Ser. No. 871,793
Int. Cl.[2] B22C *17/02*
U.S. Cl. 164—226 2 Claims



1. In a core box assembly composed of an upper section and mating lower section, the improvement comprising:

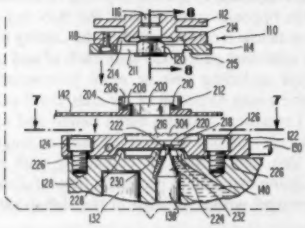
(a) said upper section having a plurality of vertically aligned holes penetrating through the top wall thereof;
(b) a flat plate mounted in a sliding relationship on the exterior of said top wall having slant openings partially penetrating therethrough and disposed above the holes in said top wall of the upper core box section, said slant openings terminating in grooves intersecting the axes of said holes at a predetermined slanted angle;
(c) slant headed pins slidably positioned in the holes in said upper core box section and extending into said first plate, the heads of said pins being slanted to the axes of said pins and adapted to engage said grooves in the flat plate; and
(d) a rod extending laterally from said plate whereby reciprocation of the rod causes the plate to reciprocate and correspondingly said pins are extended into or withdrawn from the interior of the upper core box section.

4,158,382

APPARATUS FOR CASTING LEAD INTO PLASTIC FOR SIDE TERMINAL BATTERIES

Terry Oxenreider, Wernersville; Donald A. Duesterhoeft, Robesonia, and Edgar M. Erb, Lancaster, all of Pa., assignors to General Battery Corporation, Reading, Pa.

Filed Dec. 23, 1976, Ser. No. 753,835
Int. Cl.² B22D *17/12*
U.S. Cl. 164—305 **19 Claims**



1. An apparatus for use in forming a lead-alloy battery terminal connector through a wall of a plastic battery case, said wall having at least one aperture therein, comprising:
(a) a plurality of mold means for engaging opposing sides of said wall to form a mold cavity about said aperture on either side of said wall, a first one of said mold means having a plurality of grooves defined therein disposed at the interface of said first mold means with said wall, said grooves providing fluid communication between the interior region of said mold cavity to the atmosphere for venting gases from the mold cavity to the atmosphere during the casting process, whereby softening of the plastic case material in the vicinity of said aperture reduces said fluid communication.

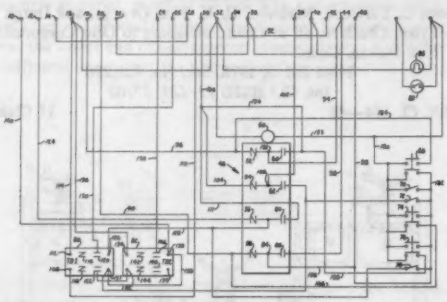
4,158,383

APPARATUS FOR COUPLING THE COMPONENTS OF A HEAT PUMP SYSTEM

John F. Rayfield, P.O. Box 597, Hollister, Mo. 65672

Filed May 25, 1977, Ser. No. 800,335
Int. Cl.² H01H *41/00*
U.S. Cl. 165—11 **9 Claims**

1. A low voltage control panel for use in heat pump systems having an indoor thermostat, an indoor heating unit, and an outdoor heating and cooling unit, said control panel comprising:
terminal means for operably coupling the control panel with the components of the heat pump system; and
removable master switching relay means for operably coupling said terminal means, said master switching relay means being capable of being removed from said control panel and replaced by a remote control means having switching means operable to remotely activate all of the



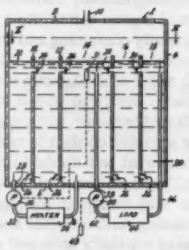
heating and cooling functions of the heat pump system individually or in combination.

4,158,384

HEAT STORAGE SYSTEM

Robert F. Brautigam, P.O. Box 102, Agenda, Kans. 66930

Filed Aug. 18, 1977, Ser. No. 825,652
Int. Cl.² F28D *21/00*
U.S. Cl. 165—32 **9 Claims**



1. A heat storage system comprising:
a. a tank containing a liquid and provided with interior walls dividing it into a central compartment and a plurality of generally annular compartments horizontally encircling said central compartment, said compartments being open at their tops and said tank being vented to atmosphere at its top, the warmest liquid in each compartment tending to rise and the coolest liquid to sink by virtue of convection currents therein,
b. check valves mounted in each of said interior walls, below the liquid level of said tank and respectively adjacent the liquid level and bottom of said tank, each of said check valves being operable to permit the flow of liquid through the associated wall in one direction only, the upper and lower check valves being operable to permit flow in respectively opposite directions,
c. a heat exchanger device exterior to said tank,
d. a heat load device exterior to said tank,
e. an input flow system operable to withdraw liquid from the outermost compartment of said tank, pass it to said heat exchanger device whereby its temperature is changed, and return it to said central tank compartment, and
f. a load flow system operable to withdraw liquid from the central tank compartment, pass it to said heat load device wherein its temperature is oppositely changed, and return it to the outermost tank compartment, said check valves opening in directions to permit the flow of liquid of the temperature closest to the output temperature of said heat exchanger from the outermost to the central compart-

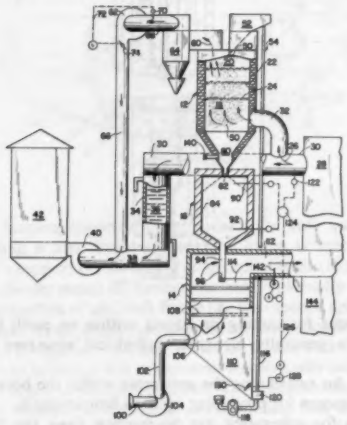
ment, and the flow of liquid of the temperature farthest from the output temperature of said heat exchanger from the central to the outermost compartment, whereby whenever said input flow exceeds said load flow, the general flow of liquid in the tank is from the central to the outermost tank compartment, and whenever said load flow exceeds said input flow, the general flow of liquid in the tank is from the outermost to the central tank compartment, the flow rate of said load flow system, when said system is actuated, being greater than the flow rate of said input flow system.

4,158,385

ENERGY RECOVERY AND STORAGE SYSTEM

Jean-Paul Vandenhoeck, 3 Shell Beach Rd., Guilford, Conn. 06437

Filed Dec. 9, 1977, Ser. No. 859,222
Int. Cl.² F28D *13/00*
U.S. Cl. 165—39 **25 Claims**



1. A method of recovering heat energy from a hot fluid in a system including a first heat exchange chamber, a second heat exchange chamber, and a storage device communicating with both said first and second chambers, including the steps of:

supplying particulate material to said first chamber,

circulating the hot fluid through said first chamber so that said particulate material thermally interacts with and receives heat energy from said hot fluid,

transferring said heated particulate material from said first chamber to said storage device to store said heated particulate material for use as needed,

supplying said heated particulate material as needed from said storage device to said second chamber,

circulating a working fluid to be heated through said second chamber so that it thermally interacts with and receives a desired amount of heat energy from said particulate material, and

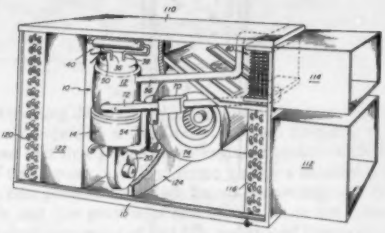
sensing a condition of said working fluid and, in response thereto, controlling the supply of heated particulate material from said storage device to said second chamber to maintain said supply of working fluid at a predetermined constant condition.

4,158,386

SELF-PUMPING WATER BOILER SYSTEM

William H. Hapgood, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 593,160, Jul. 3, 1975, which is a division of Ser. No. 475,725, Jun. 3, 1974, which is a continuation-in-part of Ser. No. 49,645, Jun. 25, 1970, which is a division of Ser. No. 10,334, Feb. 11, 1970, Pat. No. 3,704,748, which is a continuation-in-part of Ser. No. 737,135, Jun. 14, 1968, abandoned, which is a continuation-in-part of Ser. No. 700,192, Jan. 24, 1968, abandoned. This application Aug. 29, 1977, Ser. No. 829,102
Int. Cl.² F25B *29/00*
U.S. Cl. 165—48 R **7 Claims**



1. In a residential air heating and cooling system comprising:

first and second regions of said system substantially isolated from each other;

first heat exchange means positioned in said first region comprising a heat exchanger having a surface for contacting a fluid and a surface for contacting the products of combustion which has a substantially greater area than said surface for contacting said fluid;

said first heat exchange means comprising a plurality of tubular members providing a conduit for fluid to be heated and having conductive bodies bonded thereto for providing the major portion of said surface contacting said products of combustion;

means for supplying said fluid from the upper ends of said tubular membrers to a reservoir above said heat exchanger and for supplying fluid as a liquid from said reservoir substantially directly to the lower ends of said tubular members;

second and third heat exchange means positioned in said second region;

a fluid circulation system comprising at least a conduit means for said fluid extending between said first and second regions;

means for supplying thermal energy from the products of combustion to said fluid through said first heat exchange means;

means for transferring thermal energy as a vapor of said fluid from said first reservoir to said second heat exchange means and back as a condensate to the lower ends of said tubular members through said fluid circulation system;

means in said second region for circulating air through said second heat exchange means; and

means for pumping thermal energy from said third heat exchange means to a fourth heat exchange means.

4,158,387

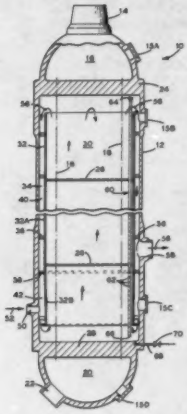
BLOWDOWN APPARATUS

Bertrand N. McDonald, Clearwater, Fla., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,437
Int. Cl.² F28F *19/00*; F22B *37/54*
U.S. Cl. 165—71 **6 Claims**

1. In combination with a heat exchanger including an upright pressure vessel, upper and lower tube sheets disposed within the vessel and defining a tube bank chamber therebe-

tween, a plurality of vertically oriented tubes extending through the tube bank chamber and supported by the tube sheets, means for directing a heated fluid through the tubes, means for directing a heat absorbing fluid around the tubes in indirect heat exchange with the heated fluid, blowdown means for expelling fluid having contaminants culled from the heat



absorbing fluid, the blowdown means comprising at least one upright pipe perforated over at least a portion of its length, the pipe being disposed within the tube bank chamber and having a sealed upper end and an open lower end, and conduit means disposed in spaced adjacent relationship with the lower end of the pipe for discharging contaminant-laden fluid from said vessel.

4,158,388

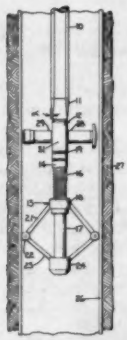
METHOD OF AND APPARATUS FOR SQUEEZE CEMENTING IN BOREHOLES

Harrold D. Owen, and Wayne O. Rosenthal, both of Fort Worth, Tex., assignors to Pengo Industries, Inc., Fort Worth, Tex.

Filed Jun. 20, 1977, Ser. No. 808,014

Int. Cl.[2] E21B *33/13*

U.S. Cl. 166—286 **26 Claims**



22. A method of squeeze cementing a region outside of a casing in a wellbore including steps of:

suspending a perforating-cementing tool in the wellbore on a packerless conduit,

securing the tool in a fixed position in the wellbore casing,

sealing an area on the inner wall of the casing from fluid communication with the interior of the casing,

activating an explosively propelled projectile in the tool to penetrate the wall of the casing within the sealed area on the inner wall of the casing; and

passing cement through the conduit into the penetration in the casing,

releasing the tool from its fixed position in the wellbore after the cement has hardened, and

withdrawing the conduit and tool from the wellbore.

4,158,389

CHEMICAL CUTTING APPARATUS AND METHOD FOR USE IN WELLS

Edmond D. Chammas, and Edwin C. Lewis, II, both of Houston, Tex., assignors to Weatherford/DMC, Inc., Houston, Tex.

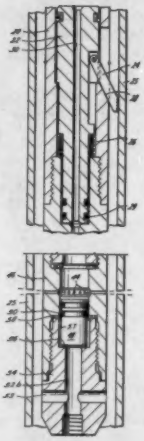
Division of Ser. No. 830,511, Sep. 6, 1977, Pat. No. 4,125,161.

This application Mar. 9, 1978, Ser. No. 885,062

Claims priority, application United Kingdom, Apr. 18, 1977, 16064/77

Int. Cl.[2] E21B *29/00*

U.S. Cl. 166—297 **11 Claims**



1. Apparatus for cutting an object within an earth bore, comprising a generally elongate, cylindrical structure that includes,

(a) means for suspending the apparatus within the bore,

(b) firing means for producing ignition temperatures,

(c) means for generating gas by ignition from the firing means (b),

(d) anchor means for maintaining the apparatus substantially stationary in axial relation to the earth bore during the cutting operation, including:

(i) a cylinder having at least one aperture in the cylindrical wall thereof,

(ii) a piston slidable within the cylinder (i),

(iii) at least one wedge member pivotally secured to the piston and engageable with the aperture of the cylinder (i), and

(iv) means biasing the piston (ii) against the cylinder (i) such that the wedge member (iii) is yieldably retained within the aperture of said cylinder,

(e) chemical means releasably contained within the apparatus for incendiary cutting of the object within the earth bore upon release of said chemical means, and

(f) discharge means for directing the chemical means (e) toward the object to be cut within the earth bore.

11. A method for cutting an object in an earth bore comprising the steps of:

(a) disposing a housing containing a chemical cutting agent, said housing having exhaust apertures communicating the interior of the housing to the exterior thereof, adjacent to the desired location of the object to be cut,

(b) generating pressure by means of a gas generator initiated by an igniter,

(c) affixing the housing substantially centrally within the earth bore by means of at least one wedge disposed within an aperture of the housing having one end of said wedge pivotally attached to an axially aligned piston slidably disposed within said housing, said piston having a bore disposed axially therethrough, whereby axial displacement of the slidable piston extends the other end of the wedge radially from the housing,

(d) contacting a reactant disposed within the housing with the cutting agent, and

(e) exhausting the cutting agent and reactant through the exhaust orifices in the housing and into the object to be cut.

4,158,390

FARMING IMPLEMENT PARTICULARLY FOR ROW CULTIVATION

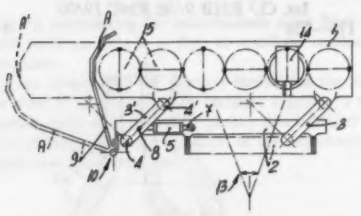
Antonio Maschio, Campodarsego, Italy, assignor to F. lli Maschino S.n.c., Campodarsego, Italy

Filed Dec. 22, 1976, Ser. No. 753,552

Claims priority, application Italy, Mar. 29, 1976, 41561 A/76

Int. Cl.[2] A01B *69/06, 65/02*

U.S. Cl. 172—5 **1 Claim**



1. A farming implement, particularly for row cultivation, comprising a fork frame (2) adapted to be connected to a tractor; a support (1) for carrying operating tools (15); oleodynamic cylinder means (5) having one end (7) pivotally mounted to a rear portion of said fork frame (2); two spaced apart parallel pivoted arms (3,3') for connecting and supporting said support (1) together with said tools (15) to said fork frame (2); first means having a first component for pivotally mounting a first end of one of said pivoted arms (3,3') and a second component for pivotally mounting a corresponding first end of the other of said pivoted arms (3,3') to portions of said fork frame (2) spaced forwardly of the portion mounting said oleodynamic cylinder means (5); second means (4') having a first component associated with the other end of one of said pivoted arms (3,3') and a second component associated with the respective other end of the other of said pivoted arms (3,3'), said components being associated with portions of said support (1) closest to said fork frame (2) and being spaced rearwardly from the portion of said fork frame mounting said oleodynamic cylinder means (5) for pivotally mounting said other end of said pivoted arms (3,3') to said support (1); another end (8) of said oleodynamic cylinder means (5) being pivotally connected to one of said two pivoted arms (3,3') between components of said first and said second means (4,4') mounting said one arm of said fork frame and said support, said oleodynamic cylinder means (5) with its ends (7,8) being disposed in a plane extending substantially transverse to the direction of movement of the tractor, said plane being interposed between the components of said first means (4) and the components of said second means (4'); and feeler means operatively associated with said oleodynamic cylinder means for sensing obstacles and for actuating said oleodynamic cylinder means to exert a force on said one of said two pivoted arms (3,3') in a direction substantially transverse to the direction of movement of the tractor.

4,158,391

SOIL AERATING DEVICE

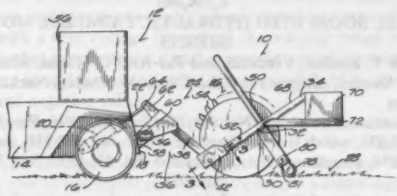
Boyd D. Clements, Elmwood, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 789,799, Apr. 22, 1977, abandoned.

This application Mar. 13, 1978, Ser. No. 885,752

Int. Cl.[2] A01B *45/02*

U.S. Cl. 172—22 **11 Claims**



1. A soil treating device adapted for connection to a vehicle, said device comprising a first frame, a drum rotatably supported from said first frame for rolling engagement with the surface of the ground, a second frame having a forward portion and a rear portion, first pivot means connecting said first frame with said rear portion of said second frame for limited relative pivotal movement of said first and second frames about a first substantially horizontal pivot axis, second pivot means connecting said forward portion of said second frame to the vehicle for pivotal movement of said first and second frames relative to the vehicle about a second substantially horizontal pivot axis between a raised position wherein said drum is disengaged from the ground and a lowered position wherein said drum is in engagement with the ground, and actuator means connected between the vehicle and said second frame for moving said first and second frames about said second pivot axis between the raised and lowered positions and for applying a downward force on said second frame when said first and second frames are in the lowered position to thereby transfer a portion of the weight of the vehicle to said drum through said second frame, said first pivot means, and said first frame.

4,158,392

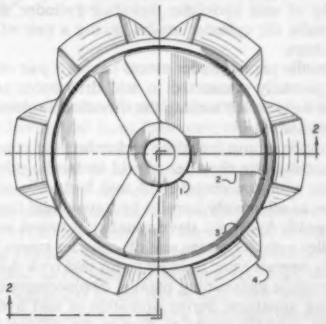
POCKET PRESS WHEEL

Bernard C. Belanger, 10905 E. Burt Rd., Birch Run, Mich. 48415

Filed Aug. 8, 1977, Ser. No. 708,489

Int. Cl.[2] A01B *29/04*

U.S. Cl. 172—548 **1 Claim**



1. A press wheel for producing pockets in the soil to collect water runoff, said wheel comprising: a cylindrical rim having a plurality of lugs of generally inverted V-shape cross section, each lug forming an angle of substantially 90 degrees and having an elongated central outer edge extending circumferen-

tially of the wheel on an arc or a circle centered on the wheel axis, the lateral sides of the lugs terminating closely adjacent to and extending generally parallel to the sides of said rim, the opposite ends of said lugs having a convexly curved central edge with the sides of said lugs tapering along said rim to merge with said central edge the lugs being closely spaced and approximately six in number.

4,158,393

DRILL BOOM WITH HYDRAULIC PARALLEL MOTION MEANS

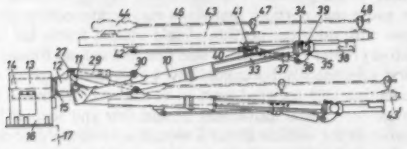
Erich V. Kimber, Vendelsö, and Per-Axel C. Rönne, Älta, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 649,249, Jan. 15, 1976, Pat. No. 4,037,671, which is a continuation of Ser. No. 480,518, Jun. 18, 1974, abandoned. This application Jul. 25, 1977, Ser. No. 818,563

The portion of the term of this patent subsequent to Jul. 26, 1994, has been disclaimed.

Int. Cl.[2] E21B *15/00*; F15B *11/22, 13/01*

U.S. Cl. 173—2 **6 Claims**



1. A drill boom arrangement with hydraulic parallel motion means for positioning an elongated rock drilling apparatus to different drilling positions with respect to a boom support, comprising in combination therewith:

a first cross shaft on said boom support,

a drill boom having forward and rear ends, said drill boom being pivoted at the rear end thereof on said first cross shaft,

a second cross shaft at the forward end of said drill boom for pivotally supporting said rock drilling apparatus,

an hydraulic elevating cylinder means pivotally connected at one end thereof to said drill boom and at the other end thereof to said boom support for selectively elevating and lowering the rock drilling apparatus to given elevation angles,

an hydraulic tilt cylinder means pivotally connected at one end thereof to said drill boom and at the other and thereof to said rock drilling apparatus for selectively tilting said rock drilling apparatus relative to said drill boom independently of said hydraulic elevating cylinder means, said hydraulic tilt cylinder means having a pair of hydraulic chambers,

an hydraulic pilot cylinder means having a pair of chambers and pivotally connected to said drill boom and to said boom support for sensing the elevation angle of said drill boom, and

an hydraulic circuit including hydraulic fluid conduit means connecting one chamber of said hydraulic pilot cylinder means with one chamber of said hydraulic tilt cylinder means to selectively transfer hydraulic fluid therebetween to provide hydraulic slave coupling between said hydraulic pilot cylinder means and tilt cylinder means to concurrently operate same in order to tilt said rock drilling apparatus while maintaining parallel displacement of the rock drilling apparatus during operation of said hydraulic elevating cylinder means to change the drilling position; a common hydraulic control valve coupled to said hydraulic pilot, tilt and elevating cylinder means for alternately pressurizing the other chambers of said hydraulic pilot cylinder means and said hydraulic tilt cylinder means simultaneously with the chambers of said hydraulic elevating cylinder means during pivoting of the drill boom; a second control valve coupled to said hydraulic tilt cylinder means for actuation thereof independently of said hydraulic elevating and pilot cylinder means; first isolating valve means for isolating said hydraulic elevating and pilot cylinder means from said common control valve during actuation of said second control valve; and second isolating valve means for isolating said second control valve from said hydraulic tilt cylinder means during actuation of said common control valve, whereby said hydraulic pilot cylinder means and said hydraulic tilt cylinder means assist the elevating and lowering movements of said drill boom, each of said hydraulic pilot cylinder means and said hydraulic tilt cylinder means assisting at least one of said movements of said drill boom.

4,158,394

MECHANISM FOR LUBRICATING THE BEARINGS OF THE CUTTING ROLLERS OF A ROLLER BIT

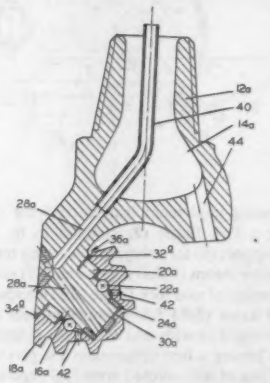
Horst M. Ernst, Eltingshausen; Armin Olschewski; Lothar Walter, both of Schweinfurt, and Manfred Brandenstein, Aschfeld, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Feb. 15, 1978, Ser. No. 878,155

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1977, 2706290

Int. Cl.[2] E21B *9/18*; F16C *19/00*

U.S. Cl. 175—228 **4 Claims**



1. In a drilling apparatus including a roller bit having an inner chamber filled with a non-compressible flushing liquid, at least one pivot and a cutting roller having a tip supported for rotation on said pivot by at least one bearing assembly, an annular gap between the outer axial end face of the cutting roller and an opposing confronting face of the roller bit spaced from said cutting roller end face, a system for lubricating the bearing assembly comprising at least one channel in the roller bit connecting the fluid chamber and said bearing assembly and at least one discharge opening in the wall of the cutting roller between said gap and tip permitting discharge of the flushing liquid to the environment around the cutting roller after passage through said bearing assembly.

4,158,395

WEIGHING DEVICE USING A RESONANT MASS-SPRING SYSTEM

George J. Brown, Capistrano Beach, Calif., assignor to Christopher Scientific Company, Anaheim, Calif.

Filed Aug. 4, 1977, Ser. No. 821,705

Int. Cl.[2] G01G *3/14*

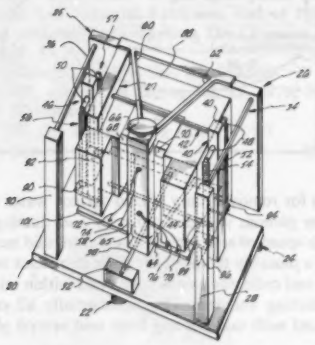
U.S. Cl. 177—210 FP **12 Claims**

1. In a frequency-dependent mass measuring unit having a

suspended primary mass capable of holding objects of unknown mass to be weighed, a means for inducing and measuring the resonant frequency of oscillation of the primary mass, and a means responsive to said inducing and measuring means for indicating the weight of the unknown mass, a suspension system comprising:

a horizontally planar baseplate and support posts extending vertically upward therefrom;

an intermediate mass;



means for suspending the intermediate mass from the support posts so that it is free to oscillate relative to the baseplate;

means for suspending the primary mass from the intermediate mass so that it is free to oscillate relative to the intermediate mass at a natural frequency much higher than the natural frequency of oscillation of the intermediate mass relative to the baseplate.

4,158,396

ELECTRONIC WEIGHT MEASURING DEVICE

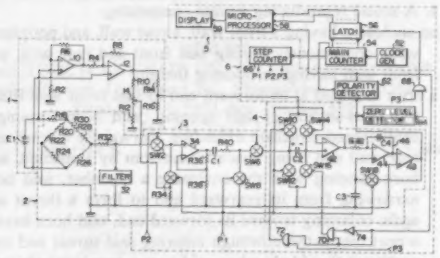
Seiji Suzuki; Yoshihisa Nishiyama, both of Shizuoka, and Tohru Kitagawa, Mishima, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1978, Ser. No. 897,363

Claims priority, application Japan, Apr. 22, 1977, 52-46606; Apr. 22, 1977, 52-46607; Apr. 22, 1977, 52-46608; Aug. 10, 1977, 52-95684; Aug. 12, 1977, 52-96790

Int. Cl.[2] G01G *3/14*

U.S. Cl. 177—210 R **22 Claims**



1. An electronic weight measuring device comprising:

a power source terminal;

a load cell connected to said power source terminal and producing an output signal corresponding to the weight of a load to be measured within a predetermined measuring range;

a signal processor circuit coupled to said load cell for processing the output signal of said load cell and producing a further output signal corresponding to said load cell output signal;

a reference voltage terminal;

bias means including a first amplifier circuit having an output terminal; a potentiometer having a movable terminal connected to an input terminal of said signal processor circuit and end terminals respectively connected to said output terminal of said first amplifier circuit and said reference voltage terminal and a resistance type voltage divider circuit connected between said output terminal of said first amplifier circuit and said reference voltage terminal; said bias means supplying said signal processor circuit with a bias voltage for setting the varying range of the output signal of said signal processor circuit corresponding to said measuring range to a range defined by positive and negative values;

an analog-to-digital converter means connected to the output of said signal processor circuit and to said resistance type voltage divider circuit for converting said output signal of said signal processor circuit into a digital signal in accordance with an output signal of said resistance type voltage divider circuit; and

a load indicating signal generator circuit coupled to the output of said analog-to-digital converter means for deriving a load indicating output signal to indicate said load to be measured from the output signal of said analog-to-digital converter means.

4,158,397

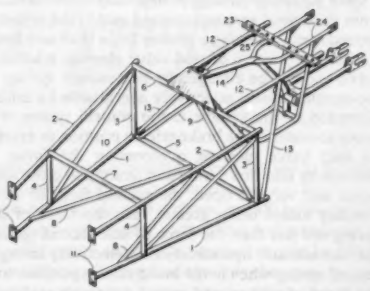
BASIC CYCLECAR FRAME

Richard F. Reynolds, 52 Springdale St., Malden, Mass. 02148

Filed Jan. 9, 1978, Ser. No. 867,693

Int. Cl.[2] B62D *61/06*

U.S. Cl. 180—25 A **2 Claims**



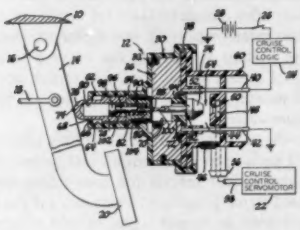
1. A cycle car frame adapted to be connected to a motorcycle frame having the front fork removed from the fork neck thereof, said cycle car frame comprising: a main frame section having an upper rear crossmember; a pair of members attached to said crossmember and extending rearwardly therefrom, a space being present between said members adapted to contain said motorcycle frame; means at the rear ends of said members adapted to connect said members to said motorcycle frame; a shaft adapted to be received through said fork neck, means releasibly connected to the top of said shaft adapted to hold said shaft within said fork neck, a horizontal member welded perpendicularly to the lower end of said shaft; means for securing said horizontal member to said crossmember; and a rigid metal plate for bracing said shaft, said plate being connected to said shaft at a point above the level of said fork neck and also connected to one of said crossmember and said horizontal member.

4,158,398

DUMP VALVE ASSEMBLY

John W. Riddel, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 23, 1977, Ser. No. 809,206
Int. Cl.[2] B60K *31/00*; F16K *31/06, 31/62*
U.S. Cl. 180—108 **9 Claims**



1. An improved dump valve assembly in combination with a vehicle brake actuator for permitting operation of a differential pressure operated vehicle cruise control system when the brake actuator is in the brake release position and for preventing operation of the vehicle cruise control system when the brake actuator is in the brake actuating position, said valve assembly comprising:

a valve defined by a valve seat and a valve element cooperating therewith to close and open said valve to respectively permit operation and prevent operation of the vehicle cruise control system by respectively permitting introduction of a differential pressure into the differential pressure operated vehicle cruise control system and preventing said introduction by dumping the cruise control system to a single pressure;

a first spring continuously exerting a force on said valve element and yieldably acting to hold said valve element in position relative to said valve seat;

a second spring when acting on said valve element exerting a force yieldably tending to urge said valve element away from said valve seat and toward said brake actuator, said second spring exerting a greater force than said first spring so that the position of said valve element relative to said valve seat can be changed by said second spring; and

force-exerting means selectively energizable by initiation of operation of the vehicle cruise control system with said brake actuator in the brake release position to exert a force on said valve element overcoming the force exerted thereon by said first spring and tending to close said valve when said valve is open, the exerted force of said force-exerting means being greater than the force of said first spring but less than the force of said second spring;

said brake actuator operatively and selectively acting on said second spring when in the brake release position to reduce the force of said second spring acting on said valve element at least to an amount which said force-exerting means can overcome when energized to close said valve, and when in the brake applying position permitting said second spring to exert a force on said valve element moving said valve element away from said valve seat in opposition to any forces exerted on said valve element by said first spring and said force-exerting means.

4,158,399

STERN SEAL ANTI-FLOODING APPARATUS

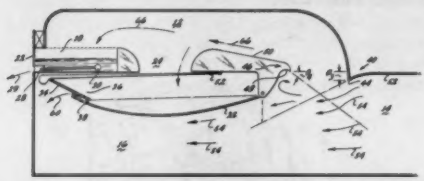
Michael A. Rickards, La Jolla, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed May 23, 1977, Ser. No. 799,496
Int. Cl.[2] B60V *1/16*
U.S. Cl. 180—127 **11 Claims**

3. Anti-flooding apparatus for a stern seal of a surface effect ship transversing above the surface of a body of water at high speeds, said ship having a central supporting plenum chamber open to the surface of said body of water, said stern seal having a forward and rearward seal member defining a stern plenum chamber therebetween, said apparatus comprises:

ducting interconnecting said plenum chambers;

a deflector plate adjacent the central plenum chamber portion of said ducting for directing substantially all of the surface water away from said ducting; and



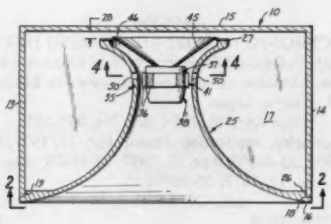
means for removing any of said surface water entering said stern plenum chamber through said ducting due to the high speed of said surface effect ship, said means comprising a plurality of apertures through at least one seal member and collector means positioned within said ducting for collecting and removing substantially all of that water forced with said ducting from said central plenum chamber.

4,158,400

SOUND REPRODUCING SYSTEM

Charles L. Vice, 9881 Verde Lomas Cir., Villa Park, Calif. 92667

Filed May 15, 1978, Ser. No. 906,119
Int. Cl.[2] H05K *5/00*
U.S. Cl. 181—152 **8 Claims**



1. A sound reproducing system comprising:

an enclosure having a front wall, a rear wall, and peripheral walls continuously joining said front and rear wall, said front wall having an opening therein;

a horn mounted at its forward end to said front wall filling the cross-section of said opening, said horn forming a cantilevered structure extending rearwardly toward said rear wall and being spaced therefrom by a spacing, said horn forming with the enclosure a chamber, said horn narrowing from its rearward end to form a throat and again enlarging toward its forward end, said horn having a port means therethrough entering said throat and connecting it to said chamber, said port means being the only fluid communication between the chamber and the inside of the horn.

a speaker cone mounted to the rearward end of said horn and enlarging rearwardly, its forward face facing into said horn;

a woofer mounted to said horn partially filling the cross-section at the throat, and thereby forming with the inside wall of the horn at the throat a throat restriction, said port entering said throat at said restriction; and

said woofer being drivingly connected to said cone; and

a tweeter mounted to said woofer and facing toward said opening.

4,158,401

DEVICE FOR CONTROLLING A PROPAGATION DIRECTION OF NOISE

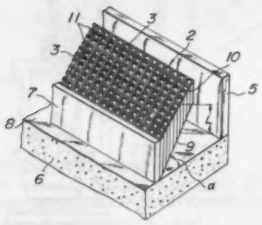
Masayasu Matsumoto, Zushi; Kazuyoshi Iida, Yokohama; Yoshikazu Kondo, Yokohama; Keiichiro Mizuno, Yokohama; Sadao Nomoto, Yokohama; Noriaki Murayama, Kawasaki; Kei Watanabe, and Tomonori Katayama, both of Yokohama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jul. 9, 1976, Ser. No. 703,985

Claims priority, application Japan, Jul. 11, 1975, 50-84412; Jul. 23, 1975, 50-101991[U]

Int. Cl.[2] G10K *11/00*; E04H *17/00*

U.S. Cl. 181—210 **11 Claims**



1. A device for controlling a propagation direction of noise, comprising a hollow structural body composed of a plurality of elongated hollow passages, said hollow passages being arranged at right angles to a substrate and having upper and lower ends open to the atmosphere, two adjacent hollow passages being different in length and at least one part of said hollow passages being separated from the substrate, the other part being located substantially on the substrate, and said hollow structural body being provided at its lower portion with a space freely communicating with the outside of said hollow structural body, whereby a part of noise emitted and propagated from a noise source is refracted and lags in phase when passed through said hollow passages and the refracted sound is interfered with a direct sound propagation passing over the upper edge of the hollow passages to produce a sound reducing region intermediate between the direct sound propagation and the refraction sound propagation.

4,158,402

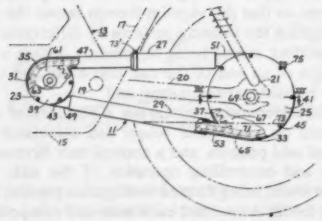
MOTORCYCLE CHAIN GUARD AND LUBRICATOR

Orville Romans, Logansport Rd., Morgantown, Ky. 42258

Filed Oct. 11, 1977, Ser. No. 840,539

Int. Cl.[2] F16P *1/00*

U.S. Cl. 184—15 R **1 Claim**



1. In combination, a motorcycle comprising:

a. a frame,

b. a driving sprocket carried on said frame and rotatable about a first axis,

c. a driven sprocket carried on said frame and rotatable about a second axis,

d. a drive chain passing over said driving and said driven sprockets,

e. a hub having one surface of predetermined contour,

f. a guard for said sprockets and said chain,

1. said guard comprising a front housing, a rear housing and a plurality of rigid pipe members interconnecting said housings to form an inflexible casing enclosing said sprockets and said chain,

2. an adapter member having an adjacent surface conformably shaped in a symmetrical pattern of cusps and ridges mating with said predetermined contour, and

3. means securing said driven sprocket to said adapter and said hub.

4,158,403

IMPACT OR SHOCK ABSORBING DEVICE FOR AUTOMOBILE SEAT BELTS

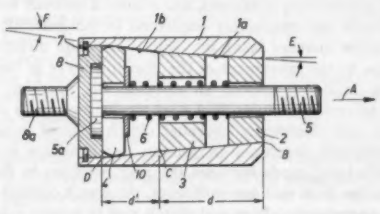
Oskar E. Peter, Schlosstrasse 9/1, D-7129 Brackenheim, Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,658

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714360

Int. Cl.[2] F16F *7/12*

U.S. Cl. 188—1 C **10 Claims**



1. Impact or shock absorbing device for use in conjunction with a car seat belt assembly, comprising

a tubular housing (**1**) with a closed end (**8**) having a first self binding conical locking section (**1***a*) and a second conical non-self-binding section (**1***b*) formed in said housing;

a first solid ring (**2**) disposed towards the open end of said housing within said first conical section (**1***a*), said first solid ring having a central bore and a tapered circumference tapering in the same direction as said first conical section (**1***a*) and in correspondence therewith;

a second solid ring (**3**) slidingly disposed within said first conical section, said solid ring having a central bore and a tapered circumference tapering in the same direction as said first conical section (**1***a*) and in correspondence therewith;

a split ring (**4**) disposed within said second conical section (**1***b*), said split ring having a central bore and a rounded circumference;

a central shaft (**5**), having a face plate (**5***a*), disposed longitudinally within the bores of said rings (**2**, **3**, **4**), said face plate abutting against the closed end of said housing; and

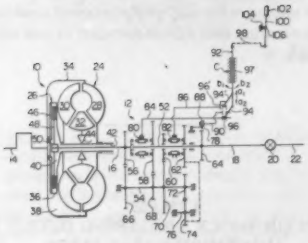
a compression spring (**6**) wound around said shaft and extending through said second solid ring (**3**), said spring being in contact with said split ring and said first solid ring (**2**).

4,158,404

ELECTRIC SWITCH APPARATUS FOR AN AUTOMATIC CLUTCH IN AN AUTOMOTIVE POWER TRAIN USING A MANUAL POWER TRANSMISSION SYSTEM

Sinobu Yamashita, and Kotei Takahashi, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Sep. 8, 1977, Ser. No. 831,408
Claims priority, application Japan, Sep. 10, 1976, 51-107697
Int. Cl.[2] F16D 67/00; B60K 21/00
U.S. Cl. 192—3.58 5 Claims



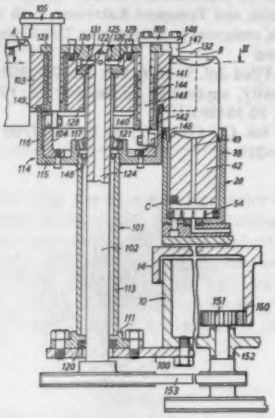
1. In an automotive power train having a power transmission system including a gear mechanism having a plurality of gear positions, a manually operated gearshift lever movable in opposite gear-shifting directions, and a control member having a center axis and operatively connected to the gearshift lever, the control member being movable in opposite directions in response to the movement of the gearshift lever in the gear-shifting directions thereof, an automatically operated clutch unit intervening between said gear mechanism and a driving source, and electrically operated clutch control means for operating said clutch unit in response to a condition in which a shift is being made between the gear positions in the gear mechanism from said gearshift lever, the clutch control means being operative to allow said clutch unit to couple when de-energized and to uncouple when energized, an electric switch apparatus electrically connected between a power source and said clutch control means and comprising a first switch assembly responsive to the movement of said gearshift lever in each of said gear-shifting directions and including a parallel combination of first switch means which is normally open and which is to close in response to the movement of said gearshift lever in one of said gear-shifting directions, and second switch means which is normally open and which is to close in response to the movement of the gear-shift lever in the other of said gear-shifting directions, and a second switch assembly including a movable member movable with said control member, a stationary member positioned adjacent the movable member, a set of curved contact elements which are curved about an axis substantially in line with said center axis of said control member, a set of substantially linear contact elements extending in crossing relationship to said curved contact elements, respectively, one of the two sets of contact elements being mounted on said movable member for constituting movable contacts and the other set of contact elements being mounted on said stationary member for constituting stationary contacts which are to be respectively contacted by said movable contacts, each of the movable contacts and the associated one of the stationary contacts constituting in combination clutch control switch means which is to open and close depending upon the relative position of said movable member to said stationary member.

4,158,405

HIGH SPEED CAN FEED MECHANISM

John M. Jackson, Potters Bar, England, assignor to Cleamax Limited, Potters Bar, England

Filed Nov. 8, 1977, Ser. No. 850,093
Claims priority, application United Kingdom, Nov. 9, 1976, 46599/76
Int. Cl.[2] B65G 29/00
U.S. Cl. 198—480 3 Claims



1. Apparatus for feeding open-mouthed cylindrical cans onto a turret rotating continuously on a frame, said turret having a plurality of can-holding units for reception of cans fed thereto in a direction substantially parallel to the rotational axis of the turret, the can-holding units being arranged on the turret so that cans therein have their longitudinal axes substantially parallel to the axis of the turret and spaced around a pitch circle coaxial with the turret, and vacuum means for drawing the cans fully into the holding units, and said apparatus comprising a feeder wheel formed with can-receiving pockets spaced around the periphery of said feeder wheel, means mounting said feeder wheel on said frame for rotation about an axis parallel to the rotational axis of the turret, gear means interconnecting the feeder wheel and the turret for rotation in synchronism, means for feeding cans into said pockets during rotation of the feeder wheel, holding means for holding cans in said pockets, and transfer means operable to transfer cans from said pockets into said holding units on the turret, wherein:

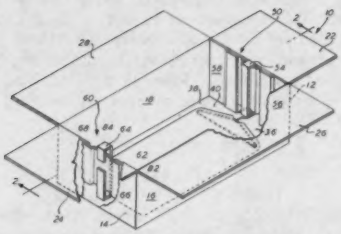
A. Each pocket comprises a part-cylindrical can locating surface adapted to engage as a close fit around part of the wall of a can, the axis of said part-cylindrical surface being parallel to the axis of the feeder wheel, and at least one end of the pocket being open to permit axial movement of a can engaged with said can-locating surface;

B. Said holding means comprise ports in said can locating surfaces, and means for extracting air through said ports, the cans on said locating surfaces at least partially closing the ports so that the vacuum therein causes the cans to be held against the locating surfaces by differential pressure, said holding means being adapted to release a can after insertion of an end of the can into a holding unit in the turret by said transfer means; and

C. Said transfer means comprises a plurality of slide units mounted on said feeder wheel and associated one with each of said pockets, and a control cam mounted on said frame and controlling operation of the slide units, the feeder wheel being formed with guides parallel to the axis of the feeder wheel, and each slide unit comprising a slide member axially slidable in one of said guides, a follower on said slide member in engagement with said control cam, resilient means urging the slide member in a direction to hold the follower against the control cam, and an abut-

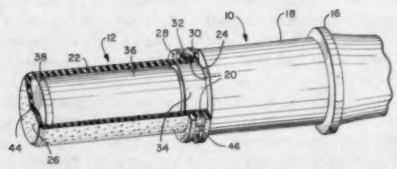
ment on said slide member adapted to engage an end of a can on the can-locating surface of the associated pocket and impart axial sliding movement to the can under control of the cam so as to transfer the can into a holding unit on the turret at the instant of alignment therewith.

4,158,406
GARMENT CONTAINER
Aaron Feder, 800 Ocean Pkway., Brooklyn, N.Y. 11230
Filed Feb. 14, 1978, Ser. No. 877,615
Int. Cl.[2] B65D *85/18*
U.S. Cl. 206—279 **7 Claims**



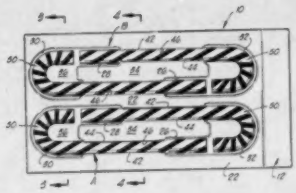
1. A garment container; comprising
(a) container means defined by a plurality of walls and of a size and configuration to hold at least one garment when disposed on a garment hanger; and
(b) hanger retaining means carried by said container means proximate at least an inner surface of one of said walls;
(c) said hanger retaining means including hanger holding means slidably disposed for co-action with holder retaining means, secured to said inner surface of said one of said walls, for movement between a first position wherein said hanger holding means is disposed to receive a predetermined part of a hanger and a second position wherein said hanger holding means secures the predetermined part of the hanger; and thereby the hanger, in position within said container means, and wherein said holder retaining means is secured to said inner surface of said one of said walls by panel means adhesively secured to said inner surface of said one of said walls so as to lodge said holder means between at least a part of said panel means and said inner surface of said one of said walls, said panel means includes a pair of panels disposed one to each side of said holder retaining means.

4,158,407
JOURNAL GUARD
Frederick G. Rest, 175 E. Delaware, Apt. 8011, Chicago, Ill. 60611
Filed Oct. 17, 1977, Ser. No. 842,473
Int. Cl.[2] B65D *85/68*
U.S. Cl. 206—318 **14 Claims**



1. A journal guard for the end portion of a wheel axle, which end portion includes a journal, a mediate section, and an end collar, said mediate section and end collar flanking the journal and having a larger diameter than said journal, and said end collar being disposed outboard of said journal, comprising:
a tubular housing member having an internal diameter substantially equal to that of the end collar and mediate section and including an open end;
a resilient housing base opposite said open end; and
means for securing said housing member to said mediate section whereby said end collar, journal, and mediate section are encased within said guard and said guard is disposed spaced apart from the surface of said journal.

4,158,408
PACKAGE FOR CANDY CANES
Fred L. Thiessen, 405 Bouziden, Moore, Okla. 73160
Filed Jun. 5, 1978, Ser. No. 912,210
Int. Cl.[2] B65D *85/20, 1/36*
U.S. Cl. 206—443 **8 Claims**



1. A package for packaging a pair of frangible candy canes comprising:
a body of synthetic resin having a top side and a bottom side, and having a pair of oval-shaped depressions therein, each of said oval-shaped depressions including:
a pair of opposed, parallel elongated side channels for receiving the straight legs of a pair of the candy canes;
a central island separating said side channels; and
rounded, recessed end portions joining the elongated side channels at opposite ends thereof each for receiving the U-shaped end portion at one end of a candy cane;
said body further including:
pairs of undercut flanges, each flange pair disposed substantially centrally of the length of one of said elongated side channels, and overhanging the respective channel, said flanges in each pair being spaced to define a cane-receiving slot therebetween for receiving through said slot between said flanges one of the elongated straight legs of a candy cane; and
throat means below the slot between each of said pair of flanges for spacing a packaged candy cane engaged by said throat means upwardly from the bottom of the respective side channel after the candy cane has been placed downwardly through said candy-receiving slot whereby no portion of either of said canes in a cane pair is susceptible to contact from the top side or the bottom side of said package, and each of the canes in said pair can be removed by rotating the canes in the pair about the axes of their legs to extend the U-shaped end portions of the canes upwardly with respect to the package, thereby allowing the underside of the canes spaced upwardly from the bottom of the package to be accessible for manually prying the canes out of the respective throat means.

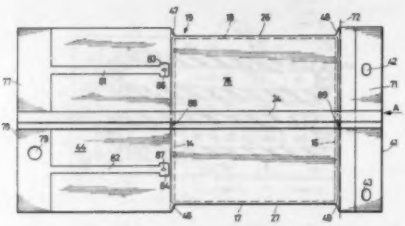
4,158,409
PACKING FOR SINGLE FILMS
Simon Duinker, Bloemendaal-Molan 1, Netherlands
Filed Jul. 18, 1977, Ser. No. 816,476
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632041
Int. Cl.[2] B65D *85/00, 85/30, 85/62*
U.S. Cl. 206—455 **25 Claims**

1. A packing for loading a plurality of flat rectangular single non-X-ray films which have the same emulsion orientation directly into a daylight-loading camera cassette comprising

a plurality of single films in a stack, each having a leading edge and a trailing edge, each of leading edges being cut straight and free of cut-away portions.

a foil envelope arrangement which surrounds the stack in a light-proof and climate-proof manner and has an easily weldable smooth plastic material foil as an internal layer, an aluminum foil as a central layer, an external layer, and has a plurality of weld seams which weld the foil arrangement together, of which two weld seams extend in parallel to each stack edge and at least one weld seam extends perpendicularly thereto and meets said two weld seams,

the foil envelope arrangement is dimensioned to enclose and embrance the stack under normal pressure conditions tightly enough to maintain the coherence between the single films of the stack and to retain the films in their



stacked orientation one above the other and to substantially limit the sideways movement of the stack but loosely enough to permit relative movement of the stack and the envelope perpendicularly to said two weld seams,

the foil arrangement having two short gussets, one lying before the leading edge of the stack and one lying behind the trailing stack edge, substantially limiting the lengthwise movement of the stack.

the foil arrangement providing a holding strip not accessible to the stack

the foil arrangement providing a pull strap not accessible to the stack extending to the other of said two weld seams and being substantially longer than the holding strip,

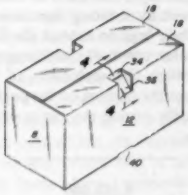
the external layer being a smooth tension-proof plastic material foil.

4,158,410

CONTAINER BLANK INCLUDING BINDING STRAP TABS

Donald F. Novatny, Marion, Ohio, assignor to Boise Cascade Corporation, Boise, Id.

Filed Mar. 14, 1978, Ser. No. 886,452
Int. Cl.[2] B65D *85/54*
U.S. Cl. 206—527 **7 Claims**



1. A unitary blank for forming a container for an article, comprising

(a) a generally rectangular blank containing a plurality of vertical fold lines which define pairs of opposed side and end wall panels;

(b) said blank including a plurality of top and bottom flaps connected with the upper and lower edges of each of said panels by horizontal fold lines, respectively;

(c) the horizontal fold line between one of said panels and the associated top flap connected thereto containing a first H-shaped cut, the horizontal fold line between the panel opposite said one panel and the top flap connected thereto containing a second H-shaped cut opposite and corresponding with the first H-shaped cut, the vertical parallel arms of each of said cuts extending from said panels across the associated horizontal fold line and into the associated top flaps, thereby to define a pair of opposed binding tabs;

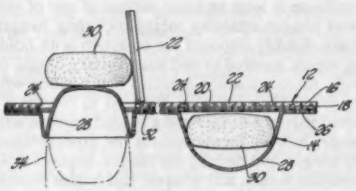
(d) the height of each of the top flaps which contains portions of the H-shaped cuts generally equalling the width of the remaining pair of panels, each of said cut-containing top flaps containing in its free upper edge a recess opposite said H-shaped cut, whereby when the panels are folded to define a tubular configuration, said recess is arranged opposite the H-shaped cut in said opposite panel, and when the flaps are folded to horizontal positions closing the upper and lower ends of the tube, the binding tabs may be folded inwardly to define in the associated edge a recess for receiving a circumferentially arranged binding strap.

4,158,411

DISPENSING PACKAGE

Douglas C. Hall, 619 Arcade, Gladwin, Mich. 48624, and Charles R. Schroeder, 30141 Wicklow, Farmington Hills, Mich. 48024

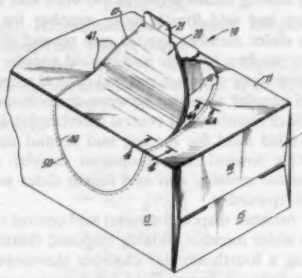
Continuation of Ser. No. 684,524, May 10, 1976, abandoned.
This application Nov. 25, 1977, Ser. No. 855,109
Int. Cl.[2] B65D *83/04, 85/56*
U.S. Cl. 206—531 **2 Claims**



1. A package for containing a plurality of individual doses of medicine that can be selectively removed one at a time from the package comprising: a laminated cover portion having an outer layer of paperboard bonded to an inner layer of metal foil; a plurality of spaced disc-like lids die cut through said outer layer only and having continuous peripheries that are completely severed from the rest of the outer layer such that said lids are prevented from separating from said cover portion only by their connection with said inner layer; said outer layer having high strength and stiffness relative to said inner layer such that the portion of the inner layer secured to each lid separates with the lid from the cover portion; a coating of heat sealable material applied to the surface of said inner layer opposite said outer layer; a container portion comprising a sheet of flexible synthetic resin material or the like with a plurality of pockets formed therein separated from each other by flat portions; said flat portions being heat sealed to said coating such that said pockets project outwardly from said inner layer of said cover portion; said coating being non-tacky except when heated to a temperature sufficient to heat seal said container portion to said cover portion, said container portion being supported on said cover portion solely by the heat sealed connection of said flat portion to said inner layer of metal foil; the container portion having a side that is completely exposed facing away from the direction toward which the pockets open to the cover portion; one of said lids overlying each of said pockets such that a medicinal dose received in a pocket can be removed from the package by collapsing the pocket and contents thereof against the cover portion to cause the inner layer to rupture at the periphery of the associated lid and the lid to

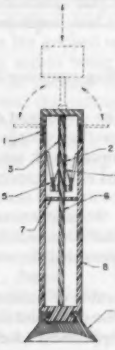
simultaneously separate from the cover portion and permit the medicinal dose to pass through the opening in the cover portion uncovered by said lid.

4,158,412
TEAR OUT OPENING DEVICE
Lawrence Wysocki, Chicago, Ill., assignor to Champion International Corporation, Stamford, Conn.
Filed Jun. 26, 1978, Ser. No. 919,227
Int. Cl.[2] B65D 5/54
U.S. Cl. 206—612 **9 Claims**



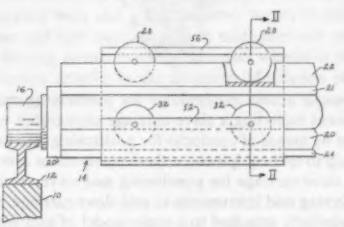
1. A paperboard carton made of a paperboard substrate including an outer, upper layer having a protective polyethylene coating, an inner, lower layer of uncoated paperboard stock, and an intermediate core layer including plies of thin, newsback board, said carton having a tear-out access member defined by a first cut portion generally oval in configuration disposed on said upper substrate surface and penetrating said upper layer to a point intermediate the thickness of the core layer, a second cut portion generally oval in configuration disposed on said under substrate surface, said second cut portion being spaced apart from the first cut portion and substantially enveloping said first cut portion, said second cut portion penetrating said lower layer to a point intermediate the thickness of the core layer; and spaced apart reinforcing means disposed on said substrate undersurface within said second cut at a predetermined angle to said second cut.

4,158,413
COLLAPSIBLE-PORTABLE TOOTHBRUSH HOLDER
Rebecca R. M. Briggs, 1505 Flagler Ave., Key West, Fla. 33040
Filed Sep. 19, 1977, Ser. No. 834,455
Int. Cl.[2] A47B 81/02
U.S. Cl. 211—65 **1 Claim**



1. A device that stands in an upright position when open supporting two or more toothbrushes and can be closed and transported when toothbrushes are removed comprising a base that can be removable or permanently attached; a tubular casing that is closed at its lower end with a shouldered boss to interlock with said base with the upper end of said casing wall reduced in thickness to make a smooth exterior surface when said casing is closed with a cap, said casing containing a shaft affixed to the underside of said cap and retained in a position axial to said casing by a vertical rod guide connected to the inside of said casing wall, a cross bar that is affixed to said shaft containing pivots about which brush holders may rotate to a horizontal position connected by arms to an operating sleeve that slides along a knurled friction surface extending the length of travel of said sleeve when opening and closing the device; the operation is such that when said cap is raised said shaft is drawn upward and said operating sleeve is pressed downward causing said brush holders to extend outward to the horizontal position and when said cap is pressed downward, said operating sleeve will slide upward on said shaft, at which time said brush holders will fold upward and, with continued downward pressure on said cap, will slide downward into said casing; said cap is then secured on top of said casing thereby closing the device.

4,158,414
CRANE DEVICE
Ray Wilson, West Alexandria, Ohio 45381
Continuation-in-part of Ser. No. 559,383, Mar. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 374,924, Jun. 29, 1973, Pat. No. 3,887,080. This application May 18, 1977, Ser. No. 798,119
Int. Cl.[2] B66C 5/02
U.S. Cl. 212—14 **22 Claims**



1. In combination with a crane structure; a main frame having a longitudinal dimension longer than lateral dimension thereof comprising spaced parallel and horizontal H beams rigidly interconnected at the ends and means supporting said main frame at the ends for movement in a first horizontal direction at right angles to the longitudinal dimension of said main frame, each said H beam having an upper and lower flange horizontal and a web vertical, each said H beam having two upper upwardly opening channel members substantially coextensive in the longitudinal direction with said upper flange, said two upper upwardly opening channel members each being fixed to the upper side of said upper flange and each lying above and on each side of the web, two lower upwardly channel members substantially coextensive in the longitudinal direction with said lower flange, said two lower upwardly opening members each fixed to the upper side of said lower flange and each lying on each side of the web, trolley means, upper support means comprising four wheels mounted on a first common shaft and each of said four wheels riding in its respective upper upwardly opening channel members on said H beams, and lower support means comprising:

(a) two inner wheels mounted on a second common shaft which ride in the respective innermost pair of the lower upwardly opening channel members on said H beams, and

(b) two outermost wheels mounted on a frame portion of said trolley means and which outermost wheels ride in the respective outermost lower upwardly opening channel

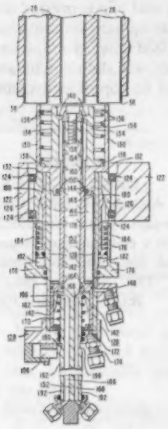
members of said H beams, said frame portion extending beneath and laterally outside of said main frame, said trolley means being connected to and supported by said upper and lower support means and said trolley means being substantially coextensive with said H beams in the vertical direction.

4,158,415

REMOTE ACCESS MANIPULATOR

Robert R. Young, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 9, 1978, Ser. No. 868,001
Int. Cl.[2] B25J *3/04*; G21C *19/32*
U.S. Cl. 414—2 **13 Claims**



1. A remote access manipulator for performing operations on equipment including a slave carriage engageable with said equipment by means of camlocks for positioning instruments in relationship to said equipment, a slave manipulator arm located near said slave carriage for positioning said slave carriage and for transferring said instruments to said slave carriage, a master carriage similarly attached to a scale model of said equipment located remote from said equipment whereby manual manipulation of said master carriage is automatically replicated by said slave carriage, a master manipulator arm located near said master carriage for controlling said slave manipulator arm whereby manual manipulation of said master manipulator arm is automatically replicated by said slave manipulator arm, and control means for coordinating movement between said carriages and said arms, each of said camlocks comprising:

bearings mounted on said slave carriage;

an inner housing rotatably mounted on said bearings;

a central member disposed within said inner housing and having a cup member attached to the top portion thereof so as to form a step that allows said cup member to rest on said inner housing;

a first slider member disposed within said cup member and capable of relative motion with respect to said cup member and a first biasing means arranged between said first slider member and said cup member for urging said first slider member against said cup member;

a second slider member slidably disposed within said cup member and said central member and capable of contacting said first slider member, said cup member, second slider member and said central member defining a first annular chamber therebetween for accommodating a first fluid for forcing said second slider member downwardly with respect to said cup member;

a third slider member disposed within said second slider member capable of sliding relative to said second slider member and having a contact mechanism formed near the top end thereof;

a fourth slider member being an integral portion of said third slider member slidably disposed within said second slider member and said central member with said fourth slider member, said second slider member, and said third slider member defining a second annular chamber for accommodating a second fluid for forcing said third slider member downwardly with respect to said second slider member thereby causing said contact mechanism to contact said equipment and to support said remote access manipulator therefrom;

a second biasing means arranged between said second slider member and said fourth slider member for urging said fourth slider member against said second slider member thereby tending to close said second annular chamber;

said second slider member and said central member defining a third annular chamber between the bottom of said second slider member and central member for accommodating a third fluid for forcing said second slider member upwardly toward said equipment thereby causing said third slider member and said fourth slider member to be moved upwardly;

an outer member disposed around said central member with a fifth slider member slidably disposed therebetween and defining a fourth annular chamber therebetween for accommodating a fourth fluid for forcing said fifth slider member upwardly against said inner housing thereby causing said inner housing to become aligned with said third slider member thus causing said slave carriage to become properly positioned with respect to said equipment; and

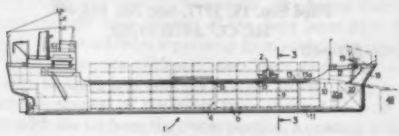
third biasing means arranged between said outer member and said fifth slider member for urging said fifth slider member downwardly.

4,158,416

SYSTEM FOR HANDLING CONTAINER CARGO AND A NOVEL SHIP AND LIFTING DEVICE

Sergio Podesta, Genoa, Italy, assignor to Container Cargo Carriers Corporation, Lausanne, Switzerland

Continuation of Ser. No. 682,981, May 4, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,257
Claims priority, application Italy, May 27, 1975, 1264 A/75
Int. Cl.[2] B66F *9/18*; B65G *63/00*; B66C *1/66*
U.S. Cl. 414—139 **7 Claims**



1. Apparatus for handling container cargo for marine transportation comprising:

a cargo vessel having an uppermost deck over a cargo hold area, a plurality of vertical storage compartments extending from the uppermost deck into the hold and a bow entrance way situated in the forecastle structure above the minimum bow freeboard, said storage compartments having hatchways on the uppermost deck provided with removable covers that form a suitable operating surface, and a ramp being provided for connecting the entrance way to a dock, and

a transport vehicle capable of unrestricted movement in all directions both on the dock and on the operating surface provided by the uppermost deck and the removable hatchway covers, said transport vehicle having a collecting means for collecting container cargo, stacking container cargo on top of each other on the support surface on which it travels, and raising and lowering container

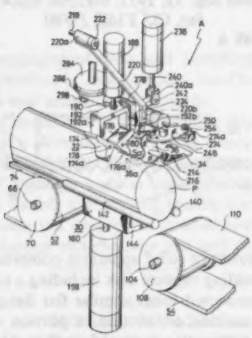
cargo below the support surface on which it travels, said transport vehicle being adapted to travel from the dock onto the uppermost deck of the vessel by means of the ramp and entrance way so as to allow for direct cargo handling, including lowering and raising container cargo vertically into and out of said vertical storage compartments from the uppermost deck and stacking container cargo on top of each other on the hatchway covers.

4,158,417

METHOD OF AND APPARATUS FOR CUTTING OUT THE PACKAGING MATERIAL OF A CYLINDRICAL PACKAGE

Yoshito Inoue, Higashimatsuyama, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Oct. 18, 1976, Ser. No. 733,492
Claims priority, application Japan, Dec. 5, 1975, 50-143838
Int. Cl.² B65B *69/00*
U.S. Cl. 414—412 **17 Claims**



1. Apparatus for cutting the package material of an elongated package containing a product comprising conveying means for moving the package forwardly along its longitudinal axis, said conveying means comprising a first and second aligned conveyor with a space therebetween, means for operating said first conveyor intermittently such that the first conveyor is operable to advance the package and then stop the package, lifting means disposed in the space between the said first and second conveyors, said lifting means being operable to lift the forward longitudinal end portion of the package when the latter has stopped its advancement by the first conveyor, gripping means disposed above said conveying means for gripping the upper side of the packaging material after the lifting means lifts the forward longitudinal end portion of the package, a cutting means comprising a tip element, said cutting means being operable to thrust ssid tip element into the packaging material between the gripped upper side thereof and the product, said gripping means being operable to release the gripper upper side of the package material after said tip element has been thrust into the packaging material, and means for actuating the cutting means to effect a scissor-like cutting action operable to cut the package material as the package is moved forwardly by said conveying means.

4,158,418

GOLF BALL COLLECTOR

Takeshi Hayashi, Naruto, Japan, assignor to Kyoei Zoki Kabushiki Kaisha, Naruto, Japan

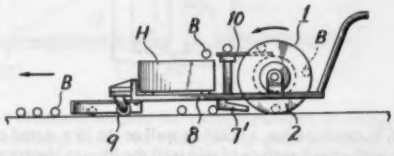
Filed Sep. 12, 1977, Ser. No. 832,356
Claims priority, application Japan, Sep. 11, 1976, 51/109074
Int. Cl.² B60P *1/00*
U.S. Cl. 414—440 **9 Claims**

1. A golf ball collecting cart which comprises:

(1) a chassis comprising a horizontal beam and two side thills attached at their forward ends to said beam and extending at a right angle to said beam in such a manner that said thills extend rearward from said beam,

(2) a ball catching unit comprising a plurality of ball catching wheels regularly spaced in parallel with each other in such a manner that the distance between two adjacent wheels is slightly smaller than the diameter of golf balls whereby adjacent wheels are able to pick up and hold golf balls therebetween, said ball catching wheels having a common axle which is supported by the rearward ends of said thills,

(3) a plurality of disk wheels, each of which is correspondingly aligned with one of the ball catching wheels, said disk wheels being regularly spaced in parallel with each



other with the distance between two adjacent disk wheels being larger than the diameter of golf balls, said disk wheels being mounted on a common shaft supported by said thills with the axis of said shaft being parallel to and positioned in front of said axle of the ball catching unit, said disk wheels being slightly elevated to provide a clearance between said disk wheels and the ground smaller than the diameter of golf balls,

(4) a ball collecting device comprising a reservoir to receive collected balls and a ball delivery means to deliver balls from said ball catching unit to said reservoir, and

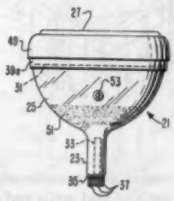
(5) a driving means to rotate said disk wheels in the reverse direction relative to the direction of rotation of said ball catching wheels.

4,158,419

IMPLOSION PROTECTED CRT

Richard A. Nolan, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,763
Int. Cl.² H01J *61/35*
U.S. Cl. 220—2.1 A **3 Claims**



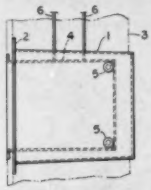
1. In combination, a cathode-ray tube comprising an envelope including a glass faceplate panel and an adjoining glass funnel sealed to said panel, an elastomeric film coating consisting essentially of polyurethane around and adhered to said panel, and a continuous metal reinforcing structure around said panel and adhered to said film coating in overlapping relationship therewith, said funnel including integral means therein for facilitating the fracturing thereof when window fragments from an implosion of said tube strike said funnel.

4,158,420

AIR AND MOISTURE BARRIER FOR ELECTRICAL OUTLET BOXES

G. Russell Balkwill, 2429 Howard Ave., Windsor, Ontario, Canada (N8X 3Y5); Jules P. Robinet, 2865 Virginia Park, Windsor, Ontario, Canada (N9E 2B8), and John F. Tamasovics, 2530 Todd La., Windsor, Ontario, Canada (N9H 1K5)

Filed May 22, 1978, Ser. No. 908,223
Int. Cl.[2] H02G 3/08
U.S. Cl. 220—3.3 1 Claim



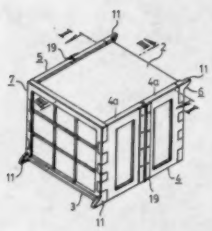
1. In combination, a building wall or the like, a stud contiguous with a back surface of said wall the like, an electrical outlet box having an open face generally flush with the wall or the like, a container made of a transparent, flexible, non-flammable plastic material so that its contents are visible at all times, said container being of a size to fit freely over and enclose said electrical box and having an open side in which said outlet box is received, said container having a narrow flange around the perimeter of the open side and extending outwardly therefrom, said container totally enclosing said outlet box with said flange being in a stressed condition and urged against and tightly contacting the back surface of the wall or the like around said outlet box, and at least one nail having a shank extending through said container from the side opposite said stud and through said outlet box from the side opposite said stud, and into said stud to affix said container and said outlet box in a fixed position relative to said building wall or the like.

4,158,421

FOLDABLE PACKING CASE

Hsu T. Chi, No. 496-2, Fu Ching St., Taipei, Taiwan

Filed Jan. 30, 1978, Ser. No. 873,641
Int. Cl.[2] B65D 7/26, 9/14
U.S. Cl. 220—6 7 Claims



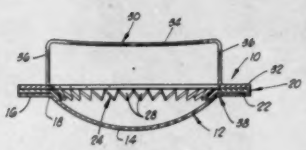
1. A packing case comprising two side walls, two end walls and two cover plates, each of said walls and each of said cover plates being of rectangular shape having two pairs of opposed parallel edges arranged perpendicular to each other, and the packing case also comprising tenon/mortise joint means and hinge means rotatably connecting one pair of edges of each side wall to respective edges of the end walls respectively, and each side wall including two rectangular half-walls each having two pairs of opposed parallel edges arranged perpendicular to each other with said one pair of edges of each side wall being formed by one edge of each of said two half-walls, and each side wall further including tenon/mortise joint means and hinge means rotatably connecting the edges of said two half-walls which are opposed and parallel to said one edges thereof, and each side wall being formed along the edges of its other pair of edges with respective longitudinal grooves in which respective edges of the cover plates are slidingly fitted, whereby upon sliding the cover plates along the grooves towards closed position the cover plates retain the half-walls of each side wall in substantially coplanar relation and retain the end walls at right angles to the side walls whereas upon sliding the cover plates along the grooves towards open position and removing the cover plates from the grooves the half-walls of each side wall can be collapsed into mutually confronting relationship.

4,158,422

SAFETY PRESSURE RELIEF APPARATUS

John E. Witten; Loren E. Wood, and Edward H. Short, III, all of Tulsa, Okla., assignors to Black, Sivalls & Bryson, Inc., Houston, Tex.

Filed Sep. 12, 1977, Ser. No. 832,417
Int. Cl.[2] F16K 17/40
U.S. Cl. 220—89 A 8 Claims



1. A safety pressure relief apparatus comprising:

a reverse buckling rupture disk including a concave-convex portion connected to an annular flat flange portion by a curved transition connection, a portion of said curved transition connection being of a substantially greater radius of curvature than other portions thereof whereby when said concave-convex portion of said disk reverses itself, such reversal starts at said portion of greater radius of curvature;

a support member having an annular flat flange portion for engaging said annular flat flange portion of said rupture disk and for supporting said transition connection thereof, said support member including a serrated cutting edge the serrations of which are inclined towards and into said concave-convex portion of said rupture disk and positioned interiorly of said transition connection forming a circular opening in said support member so that when said concave-convex portion of said rupture disk reverses itself, said cutting edge severs said disk whereby a section thereof passes through said opening in said support member; and

a bar for catching said severed section of said disk after it passes through said opening in said support member, said bar being attached to said support member and positioned across said opening in said support member in a plane substantially parallel to the plane of said annular flat flange portion thereof.

4,158,423

SEALABLE CLOSURE FASTENER

Anthony J. Starr, Wilmington, Del., assignor to Container Corporation of America, Chicago, Ill.

Filed Nov. 13, 1978, Ser. No. 959,468
Int. Cl.[2] B65D 45/32
U.S. Cl. 220—320 5 Claims

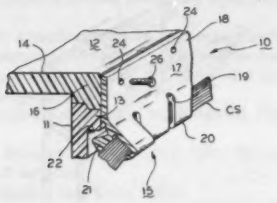
1. In a sealable closure arrangement for a plastic container body and a fully removable cover of like material therefor:

(a) a unitary, tubular body having an open upper end terminating in an annular stiffening rib;

(b) said rib having a shoulder extending radially from said body;

(c) a cover having a central portion and a peripheral rim arranged to lie upon said annular stiffening rib in sealing engagement therewith;

(d) clamping structure for maintaining said rib and said peripheral rim in sealing engagement comprising a clamping band engageable with said stiffening rib and said peripheral rim, the upper extremities of said clamping band



being in engagement with said peripheral rim and the lower extremities of said clamping band being in engagement with said annular stiffening rib;

(e) the lower extremities of said clamping structures being in the form of a skirt discontinuous at intervals throughout the length thereof to provide for constriction thereof about said container body at said stiffening rib;

(f) said skirt having a guideway therein for a strand positioned therein and adapted to be tensioned so as to force said skirt against said shoulder and said container body.

4,158,424

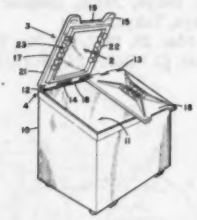
RUBBISH BIN LID

Martha Carmack, 510 S. Mariposa, Ste. 205A, Los Angeles, Calif. 90020

Filed Nov. 13, 1978, Ser. No. 959,490

Int. Cl.[2] B65D *43/14, 51/04*

U.S. Cl. 220—343 **8 Claims**



4. Rubbish bin lids for closing off a generally rectangular top opening of a rubbish bin, the upper edge of the rear wall of said rubbish bin having hinge members secured thereto, with openings for receiving a hinge rod, each of said lids including:

(a) top and bottom generally rectangular walls having front, rear, left and right edges connected together to define a sealed hollow interior,

(b) said bottom wall having a downwardly projecting internal channel spaced inwardly of the front, rear, left and right edges of the lid to define a rectangular shape of smaller dimensions than the remaining portions of the lid to fit in sealing relationship within one half of the rectangular top opening of the rubbish bin so that the complete rectangular opening is closed off when two of the lids are in side-by-side relationship,

(c) said top wall including raised ribs having parallel central portions which diverge towards the four corners of the lid to thereby inhibit use of such lid as a water, grass or snow sled if turned upside down.

4,158,425

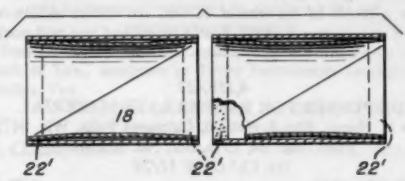
COMPOSITE CONTAINER CONSTRUCTION

Jerry F. Sansbury, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Dec. 30, 1977, Ser. No. 865,799

Int. Cl.[2] B65D *5/56, 3/26, 25/14*

U.S. Cl. 220—461 **5 Claims**



1. In a container adapted for vacuum packing, an elongated shape-sustaining composite body having inner and outer wall faces and opposed first and second end portions, a flexible hermetic liner within said body substantially coextensive with said body, said liner having opposed first and second end portions generally aligned respectively with the first and second end portions of the body, adhesive on said liner means securing the first and second end portions of the liner respectively to the inner face of the wall of said first and second internal end portions of the body, said liner, between the adhered first and second end portions thereof, being free of said body and independently freely inwardly flexible relative to said body.

4,158,426

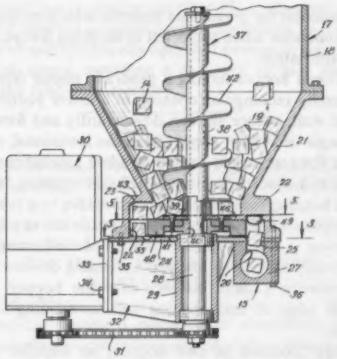
DISPENSING SYSTEM AND METHOD FOR DISPENSING DISCRETE ELEMENTS

Edwin H. Frohbieter, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 21, 1977, Ser. No. 789,733

Int. Cl.[2] G01F *11/24*

U.S. Cl. 222—1 **20 Claims**



10. Dispensing apparatus for dispensing seriatim preselected numbers of ice bodies of substantially uniform preselected configuration from a hopper defining a storage space, comprising:

an agitator in a bottom portion of said storage space for effectively precluding fusing together of said ice bodies;

means defining a recess opening substantially horizontally to said storage space bottom portion, said ice bodies being guided by said hopper and agitator generally horizontally

into said recess, said recess having a height substantially smaller than that of said storage space and slightly greater than the largest dimension of said elements whereby the ice bodies are received therein in a single layer, said means defining the recess including an overlying shelf preselected to effectively preclude overburden-induced clumping of said ice bodies in the recess; and

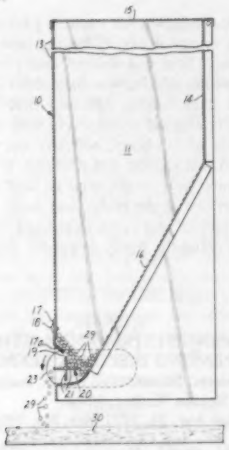
transfer means-for transferring a preselected number of ice bodies from said recess to a discharge position, said transfer means defining a pocket opening to said recess for receiving said preselected number of ice bodies therefrom as a result of movement of said ice bodies as discrete, separate elements through said recess and into said pocket.

4,158,427

DISPENSER FOR PARTICULATE MATERIAL

Hiram B. Hegge, Rte. 8, Box 96, Chippewa Falls, Wis. 54729

Filed Mar. 24, 1975, Ser. No. 561,070
Int. Cl.[2] G01F *11/24*
U.S. Cl. 222—317 6 Claims



1. A dispenser for particulate material which becomes sticky and agglomerates when subjected to shearing forces, comprising in combination:

an enclosed hopper having a generally planar front wall, a generally rectangular opening in a lower portion of said front wall, a floor sloping downwardly and forwardly at an angle of at least about 60° to the horizontal, extending from the rear of said hopper to a line parallel to said front wall and spaced rearwardly of said opening, said floor then bending forward in a smooth curve to a substantially horizontal plane and terminating at the lower edge of said opening, a stub portion of said front wall, constituting a vertically adjustable lift gate, extending downwardly and rearwardly a short distance into the hopper from the upper edge of said opening and terminating in a distal edge,

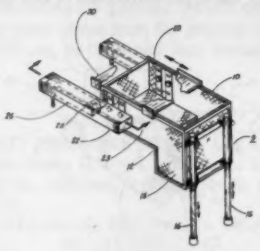
rotatably mounted in said hopper, an impeller having a horizontally disposed shaft in a plane parallel to said front wall, said impeller being positioned below the distal edge of said stub portion, above the floor and forward of the lower edge of said opening, a plurality of paddles extending generally radially from said shaft along substantially the entire width of the hopper, the the radial length of said paddles being such as to slightly clear the distal edge of said stub portion, and means for slowly rotating said impeller in a direction such that said paddles move from top to bottom when viewed from the outside of said opening.

4,158,428

DROP ON LIFT OFF BASKET ASSEMBLY FOR A WHEELCHAIR

Clarence W. Bates, 353 Palmetto La., Golden Meadow, La. 70357

Filed May 18, 1978, Ser. No. 907,232
Int. Cl.[2] B60R *11/00*
U.S. Cl. 224—42.42 A 3 Claims



1. A drop-in lift-off basket assembly for a wheelchair, having foot and arm rests, and comprising in combination:

(a) rectangular and open-topped basket means, having a two-step closed bottom that depends forwardly;

(b) telescoping legs mounted on the forward and depending end of said basket means, said legs being extendable vertically downward to engage said foot rest; and

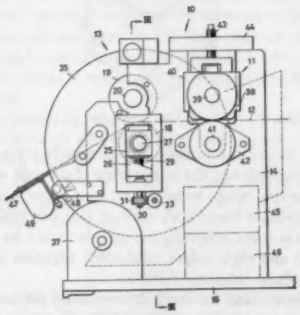
(c) bottom-recessed arm rests respectively mounted on the oppositely disposed sides of said basket means and intermediate the top and bottoms thereof to extend rearward therebeyond, and being adapted to engage in said bottom recesses said wheelchair arm rests, and in cooperation with said legs, support said basket means horizontally on said wheelchair against transverse and downward forces.

4,158,429

APPARATUS FOR FEEDING ELONGATE SHEET MATERIALS

Koichiro Ohmori, Tokyo, Japan, assignor to Honshyuseishi Kabushiki Kaishya, Tokyo, Japan

Filed Mar. 28, 1977, Ser. No. 782,227
Int. Cl.[2] B65H *23/18, 17/20*
U.S. Cl. 226—34 4 Claims



2. An apparatus for feeding an elongated sheet material, comprising:

a rotatable drive roller, said drive roller having a resilient cylindrical surface;

a frame for supporting said drive roller;

means for rotating said drive roller;

a pressure roller cooperative with said drive roller to form a

nip therebetween for receiving and feeding the elongated sheet material;

means for variably biasing said pressure roller and said drive roller together, including an axle having a central portion supporting said pressure roller thereon and a pair of journal portions eccentric to said central portion, said pressure roller being movable toward and away from said drive roller by rotation of said axle; and

means for moving said axle toward and away from said drive roller, including a pair of bearings supporting therein said journal portions of said axle and a pair of slide members slidably mounted on said frame and supporting said bearings,

whereby the periphery of said resilient cylindrical surface can be deformed and reduced in size as the biasing force is increased, thereby varying the speed at which the elongated sheet material is fed.

4. An apparatus for feeding an elongated sheet material, comprising:

a rotatable drive roller, said drive roller having a resilient cylindrical surface;

means for rotating said drive roller;

a pressure roller cooperative with said drive roller to form a nip therebetween for receiving and feeding the elongated sheet material; and

means for variably biasing said pressure roller and said drive roller together, including an inner axle and an outer axle rotatably supported on said inner axle, said pressure roller being rotatably mounted on said outer axle, said outer axle being eccentric to said inner axle, whereby said pressure roller is movable toward and away from said drive roller by rotation of said outer axle on said inner axle,

the periphery of said resilient cylindrical surface being deformed and reduced in size as the biasing force is increased, thereby varying the speed at which the elongated sheet material is fed.

4,158,430

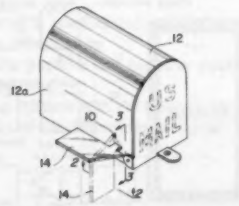
GRAVITY OPERATED FLAG INDICATOR DEVICE FOR MAILBOXES

Ewell F. Wideman, 305 Crommelin Dr., Wetumpka, Ala. 36092

Filed Jun. 21, 1978, Ser. No. 917,486

Int. Cl.[2] A47G *29/12*

U.S. Cl. 232—35 **1 Claim**



1. In combination, a mailbox including a pivotable door and a gravity operated flag indicator device, said flag indicator device comprising a flag indicator, a latching arm affixed to said flag indicator, means for pivotably mounting said flag indicator with respect to the mailbox so that the flag indicator is disposed outside of the mailbox and the latching arm is disposed within the mailbox, said latching arm being disposed adjacent to the door of said mailbox and being shaped and dimensioned such that when said flag indicator is in a first, horizontal position thereof and said door is closed, the free end of said latching arm engages said door to thereby latch said flag indicator in said first, horizontal position thereof, said latching arm being released from engagement with said door when said door is opened so that the flag indicator will pivot under the force of gravity to a second, vertical position thereof, said flag indicator including a hub portion mounted in a sidewall of said mailbox adjacent to the bottom wall of the mailbox, and said latching arm comprising a curved member which includes a portion at the free end which engages the bottom wall of the mailbox in the latched position thereof and a tip end portion of the free end which engages the inside wall of the mailbox door, the straight line distance between the pivot axis of the flag indicator and said tip end portion being greater than the straight line distance between the pivot axis and the inside wall of said door.

4,158,431

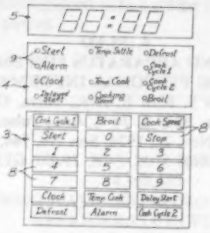
SELF-TEST FEATURE FOR APPLIANCES OR ELECTRONIC SYSTEMS OPERATED BY MICROPROCESSOR

Michael G. van Bavel, Sugarland, and Alan J. Shannon, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 10, 1976, Ser. No. 749,487

Int. Cl.[2] G06F *11/04*

U.S. Cl. 235—304.1 **10 Claims**



1. Apparatus having a plurality of electrically operated devices including electrically operated visible indicia, a plurality of manually operable input means for entering functional commands, microprocessor means connected to the devices and receiving inputs from the input means, said microprocessor means containing a fixed, permanently programmed read-only-memory for storing instruction words which define operating sequences for the apparatus, the microprocessor means further including logic means for sequentially executing the instruction words to operate the devices in response to commands from the input means, the microprocessor means having self-contained test control means operable in response to actuation thereof without external control equipment to energize at least some of said electrically operated devices in sequence, the test control means including a sequence of said instruction words in the read-only-memory.

4,158,432

CONTROL OF SELF-TEST FEATURE FOR APPLIANCES OR ELECTRONIC EQUIPMENT OPERATED BY MICROPROCESSOR

Michael G. van Bavel, Sugarland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

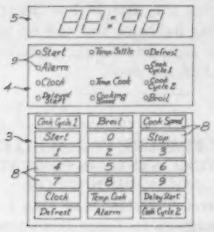
Filed Dec. 10, 1976, Ser. No. 749,488

Int. Cl.[2] G06F *11/04*

U.S. Cl. 235—304.1 **10 Claims**

1. Apparatus having a plurality of electrically operated devices including electrically operated visible indicia, a plurality of manually operable input means for entering functional commands, microprocessor means connected to the devices and receiving inputs from the input means via input terminals, said microprocessor means containing a permanently-programmed read-only-memory for storing instruction words which define operating sequences to operate the devices in response to commands from the input means, the microprocessor means selectively activating the devices through output terminals which are connected to the devices, the microprocessor means having self-contained test control means

operable in response to actuation thereof to energize at least some of said electrically operated devices in sequence, operation of the test control means being initiated by contact means



separate from the input means, the contact means selectively connecting at least one of the output terminals to at least one of the input terminals, the test control means including a sequence of said instruction words in the read-only-memory.

4,158,433

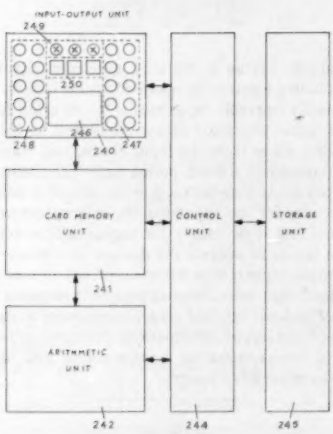
METHOD OF AND APPARATUS FOR SECURING AND STORING PERSONAL INFORMATION

Glen Peterson, 540 S. 83rd E. Ave., Tulsa, Okla. 74112, and Robert E. Fearon, 5246 S. 76 E. Ave., Tulsa, Okla. 74145

Filed Nov. 22, 1976, Ser. No. 744,142

Int. Cl.[2] G06K *5/00, 7/08, 19/06;* **G11C** *7/00*

U.S. Cl. 235—380 **18 Claims**



1. An electronic computer system comprised of more than one substantially identical computers each of which is comprised of at least an Input-Output Unit, a Card Memory Unit, an Arithmetic Unit, a Control Unit, an Information Storage Unit, and a multiplicity of Customer Memory Cards, and wherein:

said Input-Output Unit has a Control Panel which consists of a multiplicity of Keys, lamps, numerical registers, and a rectangular Indentation disposed to accept said Customer Memory Cards, and internally at least grids of drive and sense lines for writing on, and reading from, said card, and adjacent the surface of said Indentation;

said Card Memory Unit has an information storage facility with an identical information storage capacity as said Customer Memory Card, and fixed grids of drive and sense lines for writing on, and reading from said information storage facility;

said Arithmetic Unit is disposed to carry out all the necessary computational and logic functions of said computer;

said Control Unit is disposed to carry out all of the steps which are programmed within it and said Storage Unit, the steps which are programmed into it by the Keys on said Control Unit, and the steps which are programmed into it by the information stored on said Customer Memory Card;

said Information Storage Unit is disposed to contain all the information essential to the complete operation of said computer, and is further disposed to accept and retain information from said Customer Memory Card and from said Keys of said Control Panel;

said Customer Memory Card is comprised of a magnetically thick continuous plane sheet of ferromagnetic material sandwiched between two thin sheets of non-magnetic electrically-insulating material;

said grid of drive lines adjacent the surface of said rectangular Indentation comprised of a multiplicity of electrical conductors paralleling said surface and divided into two sets, with the conductors of each set substantially parallel to each other, with each of the conductors of a first set making an angle with each of the conductors of a second set and thereby forming an array of conductor crossings, with the conductors of each set selectively energized with electric current under the programmed control of said Control Unit and of such magnitude that when current flows in both conductors of an intersecting pair of conductors, at the same instant of time, a magnetic field is established, the tangential component of which is sufficient to magnetically saturate a spot in said ferromagnetic sheet of material of said Customer Memory Card which is placed in said Indentation, said spot being immediately under said conductor crossing and said saturation polarized in a direction parallel to the plane of said sheet and fixed in direction by the direction of current flow in said conductors.

4,158,434

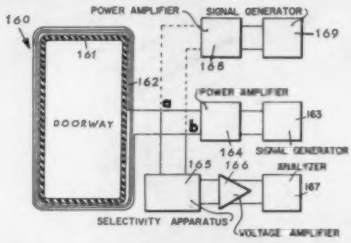
ELECTRONIC STATUS DETERMINING SYSTEM FOR GOODS

Glen Peterson, 540 S. 83rd E. Ave., Tulsa, Okla. 74112

Continuation-in-part of Ser. No. 874,760, Nov. 7, 1969, Pat. No. 4,055,746. This application Oct. 22, 1976, Ser. No. 735,070

Int. Cl.[2] G06K *5/00, 19/06*

U.S. Cl. 235—382 **19 Claims**



1. An electronic status determining system for goods comprised of more than one substantially identical apparatuses each of which includes, in combination, means for producing no more than two magnetic states in a ferromagnetic memory label, means for altering the state produced, means for determining the state that has been produced, means for storing information, means for programming said stored information, energizing means, and alarm sounding means;

Said means for storing information comprised of two portions:

A first portion of which is stored within each of said apparatuses in the form of instructions;

A second portion of which is not contained in any of said apparatuses and is comprised of a multiplicity of ferromagnetic memory labels attached to said goods and

controlled by an agency responsible for said goods, and by customers of said agency;

Said goods, with labels attached, from time to time carried by said customers through said means for altering the magnetic state produced, and through said means for determining the state that has been produced;

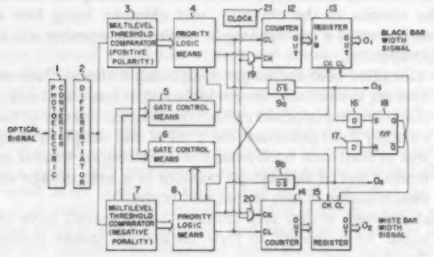
Each of said labels comprised of parallel sheet members in close proximity to each other, at least one of said sheet members comprised of ferromagnetic substance;

Said means for producing no more than two magnetic states in said memory labels comprising means which produce a multiplicity of long lines of magnetic saturation in said ferromagnetic substance, said lines of magnetic saturation running substantially the full length of said memory labels and parallel to each other.

4,158,435
METHOD AND APPARATUS FOR READING LABEL BAR CODES

Sadao Nakanishi; Kazuhiro Suzuki; Nobufumi Tokura, and Shinichiro Endo, all of Ise, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1978, Ser. No. 895,032
Claims priority, application Japan, Apr. 14, 1977, 52/44002
Int. Cl.[2] G06K *7/10*; G08C *9/06*; G11B *5/09*
U.S. Cl. 235—463 **12 Claims**



1. A method for reading a bar code label comprising the steps of:

differentiating a photoelectric signal representative of the bar code information;

detecting the positive and negative peaks of the differentiated signal; and

determining the time interval between the positive and negative peaks of the differentiated signal.

4,158,436
VARIABLE TIMING CIRCUIT FOR CARD READERS AND THE LIKE

Eric E. E. Vanderheyden, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

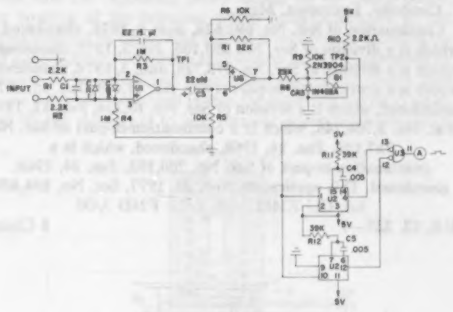
Filed Jul. 25, 1977, Ser. No. 818,776
Int. Cl.[2] G06K *7/10, 9/00*; G11B *5/09, 15/12*
U.S. Cl. 235—466 **6 Claims**

1. In a card reader, a variable timing circuit compensating for variations in the speed of a card travelling past a read head, said variable timing circuit comprising:

a reference voltage generator responsive to an input train of pulses to charge a capacitor to a voltage level serving as an interrogating point for the next bit interval;

a sample and hold circuit receiving an output of said reference voltage generator which output is sampled and stored upon gating of said sample and hold circuit;

a timing circuit nominally adjusted to a portion of the expected bit cell interval and receiving an output of the sample and hold circuit causing the time interval to vary with the sampled data rate; and

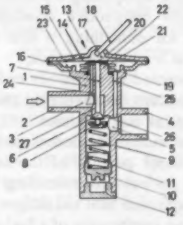


an output logic circuit receiving data input and passing it when accompanied with a strobe pulse from said variable timing circuit.

4,158,437
THERMOSTATIC EXPANSION VALVE FOR REFRIGERATION PLANTS

Leif Nielsen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 644,756, Dec. 29, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 757,990
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1974, 2459485
Int. Cl.[2] F16K *31/126*
U.S. Cl. 236—92 B **1 Claim**



1. A thermostatic expansion valve assembly comprising a casing defining a chamber and inlet and outlet ports separated by a valve seat, a closure member cooperable with said valve seat and spring means biasing said closure member in a closing direction, a diaphragm dividing said chamber into upper and lower chambers with said upper chamber having a capillary tube inlet, a centrally disposed disk bearing against the lower side of said diaphragm, rod means between and attached to said disk and said closure member, a bellows in said lower chamber attached to said disk and surrounding said rod, first passage means providing fluid communication between said inlet port and the interior of said bellows to supplement the closing force of said spring means, second passage means in said casing which extends from said outlet port into a portion of said lower chamber externally of said bellows to provide fluid communication between said outlet port and said lower chamber exteriorly of said bellows to provide valve biasing pressure in the closing direction.

4,158,438

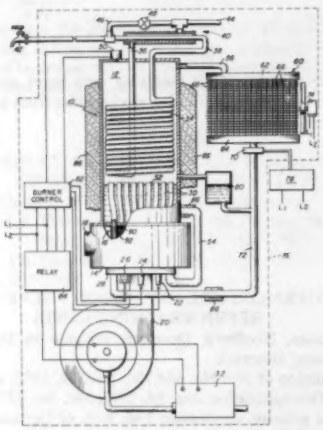
SELF-PUMPING WATER BOILER SYSTEM

William H. Hapgood, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 692,628, Jun. 3, 1976, abandoned, which is a division of Ser. No. 593,160, Jul. 3, 1975, abandoned, which is a division of Ser. No. 475,725, Jun. 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 49,645, Jun. 25, 1970, abandoned, which is a division of Ser. No. 10,334, Feb. 11, 1970, Pat. No. 3,704,748, which is a continuation-in-part of Ser. No. 737,135, Jun. 14, 1968, abandoned, which is a continuation-in-part of Ser. No. 700,192, Jan. 24, 1968, abandoned. This application Nov. 23, 1977, Ser. No. 854,450

Int. Cl.[2] F24H *3/06, 1/22;* F24D *3/08*

U.S. Cl. 237—7 8 Claims



1. In a residential air heating system comprising:

a first heat exchanger comprising a plurality of substantially vertical thermally conductive conduits surrounding a central plenum for containing a first fluid and rigidly interconnected at least at their ends;

a first plenum connected to the lower ends of said substantially vertical conduits for supplying said fluid as a liquid to the lower ends of said conduits;

a plurality of solid members bonded to said conduits and providing the major portion of the surface areas of a plurality of flue gas passages extending from said plenum outwardly through said heat exchanger;

means for producing combustion of a fuel-air mixture in said plenum;

the portions of said conduits in heat exchange relation with products of said combustion being filled with the liquid of said fluid when said combustion is initiated;

a second plenum supplied with said fluid from the upper ends of said vertical conduits for separating the vapor portions of said fluid from the liquid portions of said fluid;

a second heat exchanger supplied with said first fluid as heated vapor through means connected between the region of said second plenum containing said heated vapor above said first heat exchanger and the upper region of said second heat exchanger;

a fan for blowing air through said second heat exchanger to extract thermal energy from said heated vapor; and

means for controlling the transfer of thermal energy from said first heat exchanger to said second heat exchanger comprising means for controlling the return of condensate said vapor from said second heat exchanger to said first plenum.

4,158,439

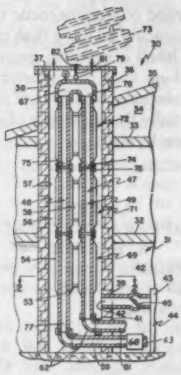
CHIMNEY WASTE HEAT COLLECTOR REQUIRING NO BUILDING RENOVATION

John W. Gibbs, 568 West St., Lunenberg, Mass. 01462

Filed Sep. 19, 1977, Ser. No. 834,173

Int. Cl.[2] F24B *7/00*

U.S. Cl. 237—55 12 Claims



1. In combination with a house heating system having a furnace, a brick chimney, a smoke flue connecting the furnace to the interior of the chimney, said chimney being free of apertures except a top opening, a smoke flue opening and an ash pit opening,

an elongated heat exchanger comprising a closed, fluid-circulating system, said system including at least two vertical fluid carrying conduits extending along the interior of said chimney from proximate the level of said ash-pit opening, and at least two horizontal lower extensions thereof extending out of said ash-pit opening to a heat storage and dissemination means within said house,

said conduits within said chimney being spaced from the inside walls thereof to form an annular smoke passage therebetween,

and one said conduit extension including an electric motorized pump for circulating said fluid in a closed, sealed path upwardly in at least one said conduit and downwardly in at least one other said conduit.

4,158,440

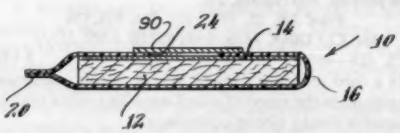
DEVICE FOR RELEASING A VOLATILE SUBSTANCE IN A CONTROLLED MANNER

William E. Sullivan, and Murray O. Meetze, Jr., both of Columbia, S.C., assignors to The Ridson Manufacturing Company, Naugatuck, Conn.

Filed Oct. 12, 1976, Ser. No. 731,300

Int. Cl.[2] A61L *9/04*

U.S. Cl. 239—1 2 Claims



1. A method for filling a device for releasing a volatile substance into the environment in a controlled manner, the device comprising a reservoir of substance-absorbent material and an envelope encapsulating the reservoir, at least a portion of which has porosity at least equal to ultramicroporosity and a greater affinity for the volatile substance than does the reservoir, said method comprising the steps of:

A. impregnating a substantially non-volatile substitute substance in the permeable envelope portion, one of the substitute substance and volatile substances being soluble in the other of said substances, and

B. introducing, at a later time, the volatile substance into the reservoir,

whereby the device may be assembled a substantial time prior to introduction of said volatile substance into the reservoir without damage to said permeable envelope portion.

4,158,441

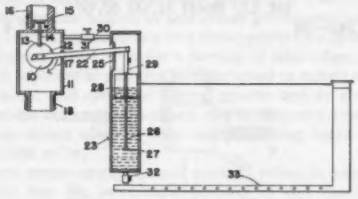
AUTOMATIC IRRIGATION SYSTEM FOR CONTROL VALVE ASSEMBLY

William Stan, 20 Blair St., Cloverdale, Calif. 95425

Continuation-in-part of Ser. No. 714,367, Aug. 16, 1976, abandoned. This application Dec. 14, 1976, Ser. No. 751,043

Int. Cl.² A01G *27/00*

U.S. Cl. 239—68 **6 Claims**



1. In an irrigation system which includes a source of water under pressure, a sprinkler system and a main valve assembly operatively connecting and disconnecting said source of water to said sprinkler system, said main valve assembly including a connecting conduit between said source of water and said sprinkler system; the improvement comprising means to control the main valve assembly between a water "on" position and a water "off" position and vice versa, said means including a water level control chamber, and means operated by the level of water in said control chamber whereby when said water level is at the maximum, said main valve assembly is in the "off" position and when said water level is at the minimum, said valve is in the "on" position and means to fill and empty said control chamber, said main valve assembly comprising an hydraulic valve, said valve including an upper chamber, a diaphragm spanning said chamber and a lower chamber below said diaphragm, water inlet and outlet means connected to said lower chamber, said diaphragm controlling the operative connection between said water inlet and outlet means, a bleed connection between said valve chambers, a two-way valve operatively connected between said upper chamber and said water outlet, pressure operated means extending between said control chamber and said two-way valve to actuate same and adjustable means operatively connected between said two-way valve and said control chamber to control the time filling and emptying of said control chamber and hence the time between actuation of said two-way valve and the actuation of said main control valve.

4,158,442

FUEL INJECTION DEVICE

Heinz Rathmayr, Hallein, Austria, assignor to Friedmann & Maier Aktiengesellschaft, Hallein, Austria

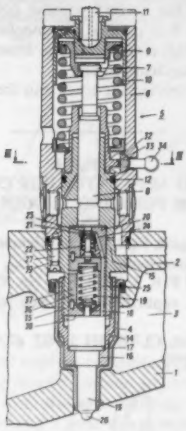
Filed Sep. 30, 1977, Ser. No. 838,221

Claims priority, application Austria, Oct. 4, 1976, 7378/76

Int. Cl.² B05B *1/30*

U.S. Cl. 239—88 **2 Claims**

1. A fuel injection device comprising an injection pump and an injection nozzle, said nozzle having a spring-loaded control pin and being assembled together with said pump to form a unit insertable into the wall delimiting the cylinder of an injection type internal combustion engine, said device comprising further a pump piston, a piston sleeve for said pump piston, and a housing for said injection pump, said piston sleeve being enclosed in said housing, the return spring acting on the pump piston, and the regulating jacket acting on the pump piston, said housing of the injection pump being attachable to the engine housing by tightening screws whose axes are parallel to said piston sleeve, whereas said injection nozzle is tightened by a sleeve nut to an element comprising said piston sleeve, said device being characterized in that the injection nozzle is tightened by the sleeve nut to said element comprising the piston



sleeve in with interposition of a pressure valve housing and a box containing a nozzle pin spring, further characterized in that the injection pump housing is tightenable to a housing of an engine with interposition of said element comprising said piston sleeve, that the injection pump housing abuts against a flange of said element comprising said piston sleeve, and that the injection pump housing is secured in relation to said element in a predetermined angle position and connected to said element only for shipping and storage purposes preferably by at least one fixing screw provided in an eccentrical position.

4,158,443

FLUID JET MACHINE

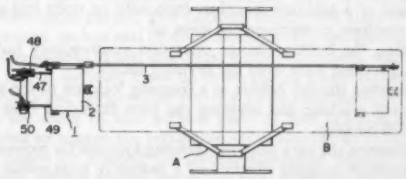
Tamotsu Kameda, 2594-5 Omiya, and Yukio Kikuta, 3-12 Chuocho, both of Fujinomiya, Japan

Filed Oct. 5, 1977, Ser. No. 839,658

Claims priority, application Japan, Jun. 2, 1977, 52-65189

Int. Cl.² B05B *3/18*

U.S. Cl. 239—184 **9 Claims**



1. A fluid jet machine comprising:

(a) a movable truck with a set of wheels;

(b) a first parallel link mechanism coupled to the truck, said first parallel link mechanism comprising a pair of horizontal arms and a rear link bar, each end of which is pivotally connected to one end of each of the arms;

(c) a second parallel link mechanism coupled to the first parallel link mechanism, said second parallel link mecha-

nism comprising a pair of other horizontal arms, the rear link bar and a front link bar, one end of each of the other horizontal arms being pivotally connected to each end of the rear link bar, the other end of each of the other horizontal arms being pivotally connected to each end of the first link bar;

(d) an oscillating mechanism arranged in the truck for oscillating the first parallel link mechanism;

(e) an interlocking mechanism connected between the first and the second link mechanisms, which controls the pivoting angle of the second parallel link mechanism with respect to the first parallel link mechanism;

(f) fluid jet nozzles disposed to the front end of the second parallel link mechanism; and

(g) a motor for driving the truck and the oscillating mechanism.

4,158,444

METHOD AND APPARATUS FOR CONNECTING A YARN AND FOR FORMING A YARN RESERVE AT A BOBBIN TUBE

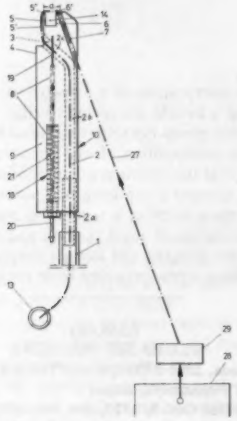
Otto Krauss, Stuttgart, Fed. Rep. of Germany, assignor to Luwa AG, Zurich, Switzerland

Filed Feb. 3, 1978, Ser. No. 874,904

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1977, 2705392

Int. Cl.[2] B65H *54/02, 67/04*

U.S. Cl. 242—18 PW **26 Claims**



1. A method of connecting a yarn and forming a yarn reserve upon a bobbin tube of an empty bobbin during a bobbin change operation after removal of the full bobbin at a spinning location of a spinning machine, especially an open end-spinning machine, comprising the steps of:

during the bobbin change operation continuously further delivering yarn from the spinning location;

removing the full bobbin at a spinning location of the spinning machine and severing the yarn extending from the full bobbin;

delivering the yarn from the spinning location for movement through a guide channel of a manually engageable and movable infeed device towards a stationary suction opening;

forming a free yarn path of travel at the infeed element prior to travel of the yarn into the guide channel;

guiding the yarn only at the start and end portions of the free yarn path of travel while rendering the yarn freely accessible at locations therebetween at all sides;

donning a new empty bobbin tube onto a bobbin holder;

manually moving the infeed element, while entraining the therethrough passing yarn, to the new empty bobbin tube;

manually shifting the free yarn path of travel by means of the infeed element towards the new bobbin tube;

bringing the yarn at such location into engagement with an engaging region of entrainment means arranged at an edge of the new bobbin tube and revolving therewith;

engaging and entraining yarn located at the free yarn path of travel by means of the entrainment means;

then severing the yarn located in the guide channel of the infeed element; and

manually removing the infeed element from the new bobbin tube.

4,158,445

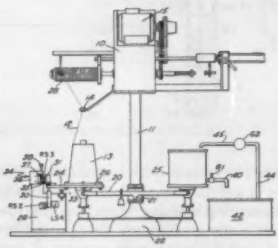
APPARATUS FOR CONTINUOUS WINDING OF WEIGHED QUANTITY OF YARN

Everett H. Newbegin, Cumberland, R.I., assignor to SER Co., Pawtucket, R.I.

Filed Feb. 21, 1978, Ser. No. 879,730

Int. Cl.[2] B65H *61/00, 63/08*

U.S. Cl. 242—39 **6 Claims**



1. In combination a skein winder having a rotatable spindle, means rotating said spindle, a balance means having a first platform to receive a yarn bobbin from which yarn is led to said spindle, a restoring force acting on said balance means, said force including a variable fluid weight, means removing a predetermined quantity of fluid weight corresponding to the desired weight of a skein, first switch means responsive to unbalance to close and initiate rotation of the spindle, second switch means responsive to balance to stop spindle rotation and initiate liquid removal of a predetermined quantity of liquid until unbalance actuates said first switch means.

4,158,446

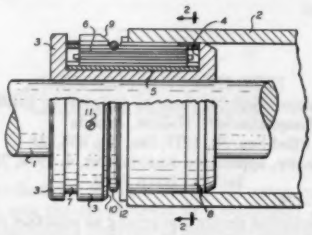
SELF-LOCKING CORE CHUCKS

Arthur T. Blake, #1 Hilltop Cir., Whippany, N.J. 07981

Filed Apr. 17, 1978, Ser. No. 896,999

Int. Cl.[2] B65H *75/24*

U.S. Cl. 242—68.2 **2 Claims**



1. A core chuck designed to lock the core of a roll of material winding and unwinding operations to a mandrel, said core chuck comprising

a core, a tubiform cylindrical chuck body dimensioned to accommodate said core,

means for fastening said chuck body onto a mandrel shaft,

said chuck body defining on the surface opposite said core at least one recess disposed parallel to the rotating axis thereof,

said recess having a terraced bottom step plate including at least one step ascending from a common center groove to each side of said recess,

the top faces of said step and of said common center groove being substantially parallel to and spaced apart at different distances from the opposite smooth face of said core,

at least one toothed roller disposed in said recess with its axis parallel to the axis of said chuck body,

the top face of each of said steps having two raised ribs spaced apart from each other to define an axially disposed groove therebetween, and receiving the corresponding tooth of said toothed roller, in order to prevent an axial movement and an inclined position of the latter,

said toothed roller having an outer diameter slightly in excess of the greatest depth of said recess with one tooth resting on the bottom of said center groove and an opposing tooth adapted to bite into the opposite face of said core to form a pivot point for a turning of said roller,

a tooth adjacent to said one tooth adapted to mount said step adjacent said common center groove and to enter said grooves between said raised ribs in response to a lateral force acting upon at least said opposing tooth of said toothed roller,

resilient means engaging said toothed roller to return said roller into the lowermost position in said recess upon cessation of said lateral force,

retaining means to prevent the over-extension of said resilient means and the outward movement of said toothed roller and of said plate, and

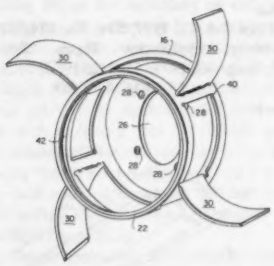
said retaining means including a substantially arch shaped stamping resting on the top face of said step plate and being enclosed by steel bands.

4,158,447

EXPANDING STABILIZING FIN CUP

Waymon Humphries, and Joseph A. Nahas, both of Laurel, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 29, 1977, Ser. No. 855,633
Int. Cl.[2] F42B *13/22*
U.S. Cl. 244—3.27 **11 Claims**



1. An expanding stabilizing fin cup for aerodynamically stabilizing a missile after launch, said missile having a tail portion including a propulsion means for generating a high pressure motive fluid disposed rearwardly thereof and attached thereto, said fin cup comprising:

a cylindrical cup attachable to said tail portion forwardly of said propulsion means; and

means for spin stabilizing said missile said means comprising a plurality of flexible fins, expandable in one direction only each fin having a root integral with the wall of said cup;

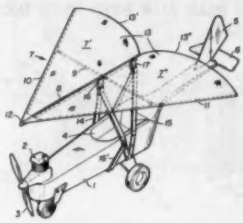
whereby upon missile launch the high pressure motive fluid causes each of said plurality of fins to expand and unfold, in the same direction, outwardly from said wall of said cap by rotation about its root to spin stabilize said missile.

4,158,448

AIRPLANE WITH PIVOTABLE WING

Matsuji Mochizuki, No. 3391-1, Muramatsu, Shimizu-shi, Shizuoka Prefecture 424, Japan

Continuation of Ser. No. 741,445, Nov. 12, 1976, abandoned.
This application Dec. 1, 1977, Ser. No. 856,430
Claims priority, application Japan, Sep. 14, 1976, 51-110190
Int. Cl.[2] B64C *3/00*
U.S. Cl. 244—13 **1 Claim**



1. A pivotal winged airplane comprising an airplane body, a pair of spaced wing support means secured fixedly to and extending upwardly from said airplane body, each of said wing support means comprising a generally inverted V-shaped support member extending upwardly from said airplane body, said inverted V-shaped support members being joined to one another in a generally V-shaped configuration, a wing comprising a wing frame and a sheet of flexible material secured to the wing frame, said wing frame including a longitudinally extending central keel means having a longitudinal axis generally bisecting the wing, said wing frame having the configuration of an equilateral triangle having an apex, said wing frame being disposed to have said apex located forwardly of the airplane body, said longitudinally extending keel means passing generally through said apex, said wing frame further comprising side frame support members extending rearwardly from said apex in a generally V-shaped configuration, said flexible sheet material being secured to said side frame support members and to said keel means and having a free trailing edge, said wing frame being provided with a pair of cross members, each of said cross members extending generally perpendicular to the axis of said central keel means from opposed sides thereof, a pair of brackets secured to opposite sides of said central keel means, each of said brackets having spaced parallel parts extending transversely of the axis of said central keel means, one of said parallel parts of each of said brackets having first pivot means for separately and independently supporting each of said cross members about parallel axes disposed on opposite sides of said keel means, each of said cross members having terminating end portions secured to said side frame support members, whereby each half of the wing frame on either side of said keel means is separately and independently pivotal about said spaced parallel axes, the other of said parallel parts of said brackets being disposed to engage the respective cross member to provide a stop means for limiting the pivotal movement of each cross member, second pivotal means on each of said wing support means for pivotably mounting said central keel means for rotation about a pivotal axis parallel to the longitudinal axis of said central keel means, said central keel means being supported by said second pivotal means in overlying relationship to the longitudinal axis of the airplane body, said second pivotal means on each of said wing support means being spaced from one another and defining a pivotal axis fixedly disposed parallel to the longitudinal axis of the airplane body, said sheet of flexible material being inflatable under flight conditions of

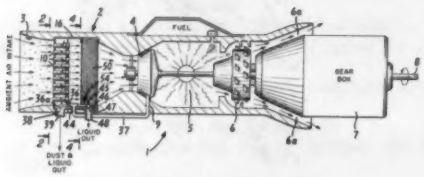
the airplane, an engine driving a propeller on the forward part of said airplane body and a rudder and stabilizer at the rear part of said airplane body, said airplane being driven with a forward motion by said propeller and being controlled in flight by said propeller, said rudder and said stabilizer, said wing being free of controls and being freely pivotal about said first and second pivotal means under flight conditions such that aerodynamic forces on said wing freely pivot said wing.

4,158,449

INLET AIR CLEANER ASSEMBLY FOR TURBINE ENGINES

Cedric Sun, Great Neck, and Charles J. Roach, Brooklyn, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Dec. 7, 1976, Ser. No. 748,598
Int. Cl.[2] B64D *1/18;* **B01D** *50/00;* **B05B** *17/02*
U.S. Cl. 244—136 **25 Claims**



1. A vortex air cleaner mist eliminator assembly comprising, in combination, a housing having an inlet and an outlet arranged for flow therethrough of air carrying heavier and lighter contaminant particles and aerosol-borne particles; and disposed in the housing across the line of air flow from the inlet to the outlet, in sequence, a first array removing heavier contaminant particles and comprising a plurality of vortex air cleaners having a straight tubular air cleaner body with a cylindrical central passage therethrough and an inlet and an outlet at opposite ends, and a deflector adjacent the inlet for creating a vortex stream in the influent air to concentrate contaminant particles in the air at the periphery of the passage, and provide a core of air at the center of the passage containing lighter and aerosol-borne contaminant particles, and an outlet member having a central core air passage communicating with the cylindrical central passage of the tubular body and disposed within the passage at the outlet, the exterior wall of the outlet member defining a generally annular contaminant scavenge passage within the cylindrical central passage of the tubular body through which pass contaminant particles, while core air at the center of the passage passes through the central core air passage of the outlet member; and a second array removing finely divided solid contaminant particles too light in weight or too well dispersed in air to be separated, and liquid droplets so finely divided as to constitute stable aerosols and mists and comprising a plurality of superimposed sheets of filamentary material defining passages therethrough from face to face of the array, arranged in flow communication with the core air passages of the outlet members of the vortex air cleaners in the first array, the array having a depth within the range from about 0.5 to about 10 inches, the sheets comprising monofilaments having a diameter within the range from about 0.005 to about 0.035 inch, and being compressed substantially throughout this surface area to a maximum pore diameter below about 5 mm under a pressure within the range from about 1 to about 100 psi, such that the pressure drop across a 1.63 ft^2 portion of the array at a standard air flow of 2930 cfm at 25° C. is within the range from about 0.5 to about 3 inches water column, the filaments at the interface of the interior layers being in pressure contact with each other substantially throughout by such compression.

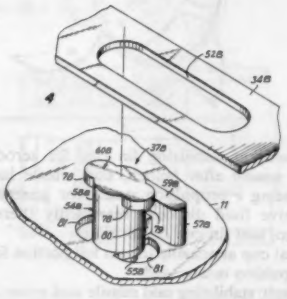
25. An inlet air cleaner assembly for the air intake of gas turbine engines comprising, in combination, a housing having a gas inlet and a fluid flow connection from the gas inlet to the air intake; a gas outlet and a fluid flow connection from the gas outlet to the gas turbine engine; the inlet and outlet and fluid connections therewith being arranged for flow therethrough of air carrying heavier and lighter contaminant particles and aerosol-borne particles; and, disposed across the line of gas flow from the gas inlet to the gas outlet, a first array of vortex air cleaners removing coarse and heavy contaminant particles, but not light and well-dispersed contaminant particles, and comprising a plurality of vortex cleaners having a straight tubular air cleaner body with a cylindrical central passage therethrough and an inlet and an outlet at opposite ends, and a deflector adjacent the inlet for creating a vortex stream in the influent air to concentrate contaminant particles in the air at the periphery of the passage, and provide a core of air at the center of the passage containing lighter and aerosol-borne contaminant particles, and an outlet member having a central core air passage communicating with the cylindrical central passage of the tubular body and disposed within the passage at the outlet, the exterior wall of the outlet member defining a generally annular contaminant scavenge passage with the cylindrical central passage of the tubular body through which pass contaminant particles, while core air at the center of the passage passes through the central core air passage of the outlet member; and a second array of sheets of filamentary woven or nonwoven material, arranged to receive partially cleaned air from the vortex air cleaner array, and remove finely divided solid contaminant particles too light in weight or too well dispersed in air to be separated, and liquid droplets so finely divided as to constitute stable aerosols and mists, and comprising a plurality of superimposed sheets of filamentary material defining passages therethrough from face to face of the array, arranged in flow communication with the core air passages of the outlet members of the vortex air cleaners in the first array, the array having a depth within the range from about 0.5 to about 10 inches, the sheets comprising monofilaments having a diameter within the range from about 0.005 to about 0.035 inch, and being compressed substantially throughout this surface area to a maximum pore diameter below about 5 mm under a pressure within the range from about 1 to about 100 psi, such that the pressure drop across a 1.63 ft^2 portion of the array at a standard air flow of 2930 cfm at 25° C. is within the range from about 0.5 to about 3 inches water column, the filaments at the interface of the interior layers being in pressure contact with each other substantially throughout by such compression.

4,158,450

MOUNTING OF PARTS ON A CHASSIS OR BASE PLATE

Yutaka Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 11, 1977, Ser. No. 814,731
Claims priority, application Japan, Jul. 30, 1976, 51/102871[U]; Aug. 10, 1977, 51/112319[U]
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—1 **27 Claims**



1. A support assembly comprising
a metal base plate having a circular hole therein; and

a synthetic resin mounting member molded through said circular hole and including a support portion molded against one surface of said base plate at an area of the latter extending outwardly from said hole, a root portion molded against the opposite surface of said base plate at an area of the latter also extending outwardly from said hole, so as to permanently join the mounting member to the base plate, and a connecting portion molded in said circular hole simultaneously with said support and root portions so as to be integral therewith and to have a circular cross-section for permitting turning of said mounting member relative to said metal base plate about the axis of said connecting portion between an initial molded position and an active position angularly spaced from said initial position and at which said support portion is operative to mount a respective part on said base plate.

4,158,451

MOUNTING FRAME

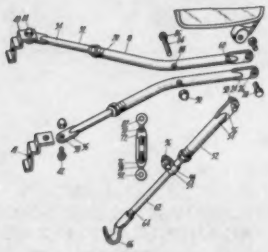
Leonard F. Lukey, 6 Florence St., Mentone, Victoria, Australia (3194)

Filed Nov. 9, 1977, Ser. No. 850,284

Claims priority, application Australia, Nov. 10, 1976, PC8083; Aug. 12, 1977, PD1210

Int. Cl.[2] B60K *1/06*

U.S. Cl. 248—479 **6 Claims**



1. A mounting frame for mounting an external rear view mirror to a vehicle, said mounting frame comprising:

(a) a substantially A-shaped upper frame having two identically shaped hollow rods in back-to-back relation such that the inner ends flare away from each other and their outer ends are joined; each of said hollow rods being provided with a sliding end rod which is a sliding fit within its associated hollow rod, and being provided with a tightening means for holding said end rod in a selected position; each end rod having at the end thereof remote from said hollow rod an attachment means for releasable attachment to the vehicle;

(b) a lower frame extending downwardly from said upper frame, said lower frame comprising a straight rod having an upper end pivotally attached to said hollow rods adjacent the joined outer ends thereof, and a sliding lower end rod which is a sliding fit within said straight rod; said straight rod being provided with tightening means for holding said lower end rod in a selected position; and said lower end rod having a securing means at lower end thereof for attachment to said vehicle; and

(c) an adjustable link joining said upper frame and said lower frame and being of variable length;

said rear view mirror being attached to said mounting frame at the joined outer ends of said hollow rods.

4,158,452

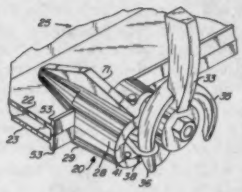
CLAMPING LOCK FOR LOOPED TIES

H. Gordon Gates, Denver, Colo., assignor to Gates & Sons, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 815,186, Jul. 13, 1977, abandoned. This application Mar. 20, 1978, Ser. No. 887,941

Int. Cl.[2] E04G *17/08*

U.S. Cl. 249—45 **50 Claims**



1. In a form having opposing walls, each of the walls being composed of a plurality of adjacent panels, each panel having a facing, rails attached to the perimeter of each facing, each rail having a web and a pair of contact flanges which project outwardly from each panel, tie notches formed in the contact flanges, the positions of the tie notches being such that when two panels are placed side by side with the contact flanges of rails of adjacent panels substantially in contact, the tie notches of the rails substantially form pairs of tie slots; a looped tie extending through the aligned tie slots of pairs of panels of opposing walls of the form with the looped ends of the tie projecting through the rails of adjacent panels of the opposing walls, a clamping lock for securing a loop of a tie to the rails of a pair of adjacent panels of a wall of the form; the improvement in the clamping lock comprising:

a pair of clamping members mountable astride said rails;

means for removably securing said clamping members together;

means forming a looped tie opening between the clamping members, said opening being substantially aligned with the centers of the tie slots; and

means attached to one of said clamping members for fixedly securing the loop of a tie to the clamping lock.

4,158,453

BOTTOM OPERABLE TANK CAR VALVE

Charles E. Reedy, Bridgeton, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,655

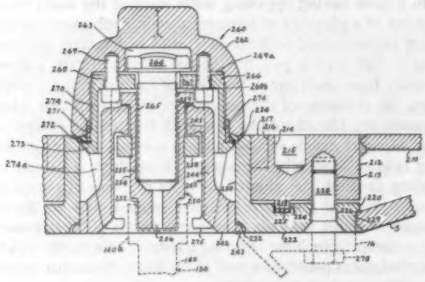
Int. Cl.[2] F16K *27/03*

U.S. Cl. 251—144 **10 Claims**

1. A bottom operable lading valve assembly for railway tank cars comprising:

a valve body adapted to be integrally attached to an opening in the bottom of a tank; said valve body having a valve

body opening therein; a retainer fitting within said valve body opening, including a connection portion and a flange portion for attaching said retainer to said valve body, said retainer including at least one retainer rib extending radially inwardly from said flange portion and terminating in a retainer connection portion having a center hub; said center hub engaging a valve operator having a flange located above said hub; said flange having an upper surface; a valve closure movable between open and closed positions relative to a valve seat located within said valve body opening; said center hub slidingly engaging said valve operator to allow rotation of said valve operator while maintaining said valve operator spaced from said valve body and vertically fixed; said valve operator having upper operator threads engaging a valve closure stem depending from said valve closure having stem threads which engage said valve operator threads; said valve closure having an opening and said closure stem having a stem portion which fits within said closure opening with vertical clearance between said stem portion and said closure; said valve closure having at least one depending member in addition to said stem extending downwardly sufficiently far to engage said rib when said closure is in open and closed positions, said depending member having



support means which support a circumferential elastomeric seal located below the lower surface of said valve closure; said elastomeric seal having a maximum vertical dimension less than said vertical clearance; whereby during rotation of said valve operator in a first direction to move said closure from closed to open position, said depending member assumes an engaged position with said rib, which prevents rotation of said closure; and whereby rotation of said valve operator in said first direction causes said closure to move vertically toward open position without rotation; said depending member being spaced from the upper surface of said flange a distance at least equal to said vertical clearance; valve closure stop means which engage when said closure assumes the full open position; and whereby rotation of said valve operator in open position in a second direction, opposite to said first direction, causes said depending member to engage said rib, and whereby rotation of said valve operator causes said closure to move vertically downwardly to a closed and seated position with said seal engaging said valve seat; and whereby, if the circumferential seal softens, melts or burns, said closure can move vertically downwardly relative to said valve operator, and said closure will engage said valve seat and substantially prevent escape of lading from the tank.

4,158,454

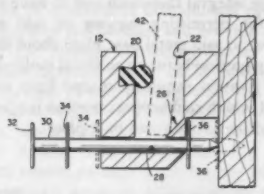
Patent Not Issued For This Number

4,158,455

WALL PANEL INSTALLATION JIG

Spencer Brown, 80 Walnut Ave., N. Amityville, N.Y. 11701

Filed Feb. 2, 1978, Ser. No. 874,389
Int. Cl.[2] B23Q *3/02*
U.S. Cl. 269—102 **11 Claims**



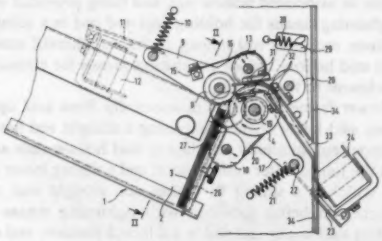
1. A wall panel installation jig comprising a channel section having a continuous opening for receiving an edge of the wall panel, fastening means for temporarily securing the channel section to a substructure, said channel section opening further including cooperative wedging and friction means for grippingly engaging the wall panel edge and angularly supporting the wall panel for attachment to the substructure.

4,158,456

DEVICE FOR SEPARATING DOCUMENTS, CARDS AND THE LIKE, ESPECIALLY PAPER MONEY BILLS

Guenter Holland-Letz, Hirschhorn, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Dec. 19, 1977, Ser. No. 861,943
Int. Cl.[2] B65H *3/06*
U.S. Cl. 271—118 **19 Claims**



1. Device for separating documents, cards and the like, especially paper money bills, which are taken up by at least one intake roller from a supply pile and by way of conveying

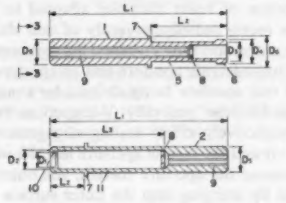
rollers serving for the conveying and taking up of documents are carried to a document outlet, wherein a separating device with at least one separating roller preventing the further conveying of double or multiple documents is provided in the conveying line, characterized in that in the conveying line between the intake roller and a take-up roller arranged before the document outlet, in addition to the separating roller, at least one braking roller is provided which is arranged after this separating roller in the conveying line, which runs along when the document is conveyed through the conveying gap between braking roller and driven conveying roller in the conveying direction, but at a lower circumferential speed as compared with the conveying speed.

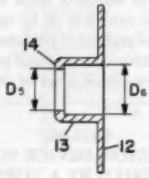
4,158,457

JUMP ROPE HANDLES

Paul J. Hydro, 202 Ridge Ave., Kennett Square, Pa. 19348

Filed Nov. 30, 1977, Ser. No. 856,115
Int. Cl.[2] A63B *5/20*
U.S. Cl. 272—75 **7 Claims**





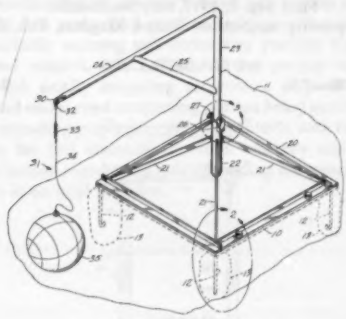
1. Handles for a jump rope comprising two elongated handles with a length substantial enough to provide a gripping area constructed from a stiff material wherein each handle has means for attaching the end of a jump rope thereto on the back end of each handle; one handle being a male handle and having on the front end a reduced portion of said length resulting in a reduced portion and a non-reduced portion of said handle and said reduced portion at the tip thereof being raised to form a lip which is still smaller than the non-reduced portion of said male handle; the second handle being a female handle and containing on the front end a hollow core section portion, and said hollow portion having at its tip an inwardly protruding lip reducing the opening of the hollow portion of said female handle wherein the hollow portion beyond the inwardly protruding lip is identical in shape and slightly larger in dimensions than the raised lip of the male handle; and the inwardly protruding lip of the female handle and the raised lip of the male handle forming a resilient snap fit so that, when the reduced portion of the male handle and the hollow portion of the female handle are placed together, they are difficult to take apart; and so that, when said handles are affixed to a jump rope, a male and female handle is attached to a respective end of said jump rope allowing the attachment of each rope to itself to form a circle and to other handles and said reduced portion of the male handle and the hollow portion of the female handle being compatible to insert the reduced portion of the male handle into the female handle's hollow core section portion.

4,158,458

TETHER BALL APPARATUS

Ismael M. Gomez, 477 Fuego St., Pomona, Calif. 91767

Filed May 16, 1977, Ser. No. 796,979
Int. Cl.[2] A63B *67/10*
U.S. Cl. 273—95 A **7 Claims**



1. Tether ball apparatus comprising:

a first horizontal rectangular base permanently anchored in a foundation;

a frame including a second horizontal rectangular base congruent with the first base, an L-shaped support having a vertical arm rotatably mounted on the frame and a horizontal arm having a free end extending beyond the perimeter of the bases, and a vertical sleeve into which the vertical arm rotatably fits;

means for limiting the rotation of the vertical arm within the sleeve;

means for fastening the second base to the first base;

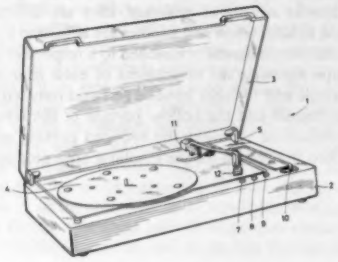
a ball; and

a tether having one end attached to the ball and the other end attached to the free end of the horizontal arm, the tether being long enough to permit the ball to lie on the foundation.

4,158,459
PICK-UP ARMS FOR RECORD PLAYERS

Günter Hoffmann, Hofheim, and Klaus Ramspeck, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Feb. 14, 1978, Ser. No. 877,661
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706720
Int. Cl.[2] G11B 3/10
U.S. Cl. 274—23 R 16 Claims

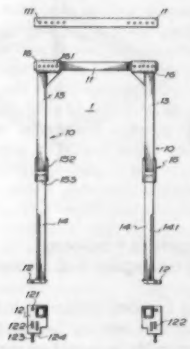


1. A pick-up arm for a record player comprising an elongated arm having a first end and a second end and movable about a pivot positioned intermediate the ends, pick-up means mounted to the first end, a weight device for balancing the pick-up arm, guide means positioned on the second end of the elongated arm a predetermined distance from the pivot, the weight engaging the guide means to position the weight the predetermined distance from the pivot.

4,158,460
ROLL BAR SAFETY FRAME FOR A TRACTOR

Malcolm White, Long Marston, near York, England, assignor to Susan Beck White, Near York, England

Filed Sep. 7, 1977, Ser. No. 831,261
Claims priority, application United Kingdom, Feb. 2, 1977, 4342/77
Int. Cl.[2] B62D 25/06
U.S. Cl. 280—756 9 Claims

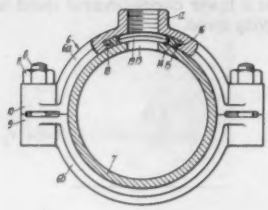


1. A safety frame for an agricultural or industrial tractor, the frame comprising two uprights adapted to be secured at their lower ends to the rear axle housing of a tractor, and a cross member which is secured or is securable between the upper ends of the uprights, each upright being provided at its lower end with a securing plate which is adapted to receive bolts for securing the upright to said rear axle housing and is provided with adjusting means for adjusting the relative positions of the bolts transversely of said axle, wherein said adjusting means comprises a bolt-receiving slot which extends transversely of said axle in use of the frame, and screw-adjustable abutment means which serves to limit the outward position of the bolt in said slot in use of the frame.

4,158,461
PIPE TAPPING BANDS

Robert A. Francis, 28 Skyline Dr., Keilor, Victoria, Australia

Filed Sep. 30, 1975, Ser. No. 619,973
Claims priority, application Australia, Oct. 1, 1974, PB9112
Int. Cl.[2] F16L 41/00
U.S. Cl. 285—111 1 Claim



1. A pipe tapping band including two half tapping bands adapted to be clamped together about a pipe, one half band including an integral internally threaded ferrule to receive a pipe tapping means, the inner surface of said one half band being formed with an annular recess around the aperture of the ferrule, said recess including a shoulder whereby the portion of the recess adjacent the ferrule is of greater diameter than the portion of the recess radially inwardly of the shoulder and adjacent the pipe to which the tapping band is applied, said portion of said recess of greater diameter being generally rectangular in cross-section, an annular resilient seal in said recess, said seal having an outwardly extending peripheral flange generally rectangular in cross-section adapted to seat in the portion of said recess having the greater diameter, and a peripheral portion of lesser diameter adapted to seat in the portion of the recess radially inwardly of said shoulder, said seal having a central aperture V-shaped in cross-section in axial alignment with the ferrule aperture and an aperture formed in the pipe, said seal aperture being defined by annular tapered peripheral lips likewise generally V-shaped in cross-section adapted to respectively effect sealing engagement with the tapping band around the ferrule aperture and the outer surface of the pipe around the aperture therein, the outer surface of one peripheral lip merging into the outer surface of said peripheral flange so as to form a continuous uninterrupted seal line when said seal is in operative position, and the outer surface of said other peripheral lip forming a linear continuation of the outer surface of said peripheral portion of lesser diameter of said seal so as to similarly form a continuous uninterrupted seal line when said seal is in operative position the surface pressure area of said other peripheral lip being less than the internal surface pressure area of said pipe, thereby eliminating pre-stressing or compression set of the pipe.

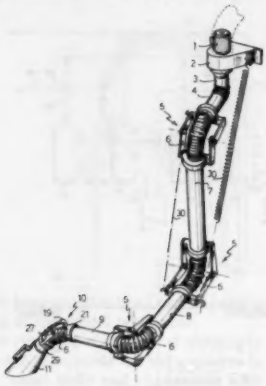
4,158,462
LOCALIZED SUCTION DEVICE WITH A SUCKING INLET HEAD CARRIED BY A TUBULAR DUCT END ORIENTABLE IN SPACE

Nevio Coral, Leini, Italy, assignor to Coral S.A.S. di Nevio Coral, Turin, Italy

Filed Dec. 3, 1976, Ser. No. 747,106
Claims priority, application Italy, Dec. 4, 1975, 69992 A/75; Apr. 7, 1976, 67818 A/76
Int. Cl.[2] F16L 27/00
U.S. Cl. 285—168 6 Claims

1. A device suitable to constitute at least a portion of tubular duct means comprising a plurality of rigid tubular sections and a plurality of unitary flexible tubular sections, the rigid tubular sections being alternated with the flexible tubular sections,

articulation means including respective pairs of brackets provided with fastening collars securing them respectively onto portions of respective ones of said rigid tubular sections in the vicinity of and spaced from ends thereof and on whose respective skirts defined by surfaces between said ends and respective ones of said fastening collars are connected opposite ends of an intermediate flexible tubular section of said plurality of unitary



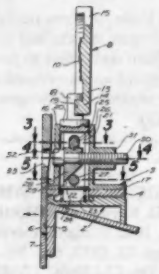
flexible tubular sections, each articulation means having at least one pivotal friction connection means between brackets of each of said pair of brackets which connection means defines a respective first axis, and wherein at least one of said articulation means includes means pivotally coupling one of its said fastening collars to one bracket of its said pair of brackets along a second axis substantially perpendicular to said first axis of said at least one articulation means.

4,158,463

ADJUSTABLE KEEPER FOR ROTARY LATCHES

Bernard W. Henrichs, Villa Park, Calif., assignor to Hartwell Corporation, Placentia, Calif.

Filed Aug. 26, 1977, Ser. No. 828,159
Int. Cl.[2] E05C *13/00*
U.S. Cl. 292—341.18 **2 Claims**



1. An adjustable keeper cooperating with a rotary latch, having an arcuate latch element rotably mounted on a panel fitting an opening bordered by a mounting frame which opening receives the periphery of the panel in flush relation to a surface surrounding the mounting frame, said keeper comprising:

a housing for mounting on a mounting frame adjacent a rotary latch element;

a movable keeper disposed in the housing and having a portion for engagement by the rotary latch element;

means for effecting adjustment of the keeper including a screw element extending transverse to the direction of movement of said keeper in said housing and accessible from the exterior of the housing;

said keeper including a radially movable cylinder means in said housing, a drive block having a beveled cam end for engaging said cylinder means;

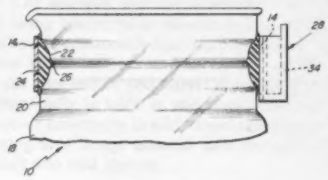
the screw element engaging the drive block to cause its beveled end to move transversely in the direction of said screw element to effect movement of the keeper.

4,158,464

UTENSIL HANDLE FOR USE IN MICROWAVES

Robert F. Bowen, Burlington, and Palmer P. Derby, Weston, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 25, 1977, Ser. No. 855,106
Int. Cl.[2] A47J *45/00*
U.S. Cl. 294—31.2 **15 Claims**



1. A handle structure for supporting a device comprising a ring member shaped to encircle said device, a handle member fixedly attached to said ring member, said ring member having a first connecting portion extending radially therefrom, said handle member having a second connecting portion assembled with said first connecting portion, and means for rigidly and nondetachably securing said connecting portions together in assembled relation, said first connecting portion being provided with axially extending projections of predetermined shape, and said second connecting portion being provided with axially extending projections shaped to interfit with the projections on the first connecting portion whereby said portions may be locked together by relative sliding movement of said portions in an axial direction.

4,158,465

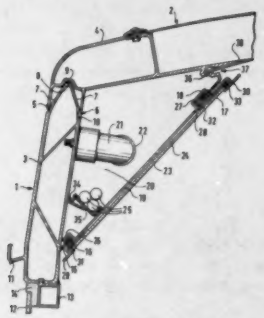
BOX-BODY CONSTRUCTION FOR BUSSES

Hans Fenner, Evilard; Wilhelm Auwärter, Gümlingen, and Karl-Heinz Stark, Muttenz, all of Switzerland, assignors to Ramseier & Jenzer AG, Carosseriewerke Bern, Bern, Switzerland

Filed Oct. 3, 1977, Ser. No. 838,987
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715549
Int. Cl.[2] B61D *17/08*
U.S. Cl. 296—193 **11 Claims**

1. An upper side carrier for busses comprising: a roof lengthwise carrier and a sidewall with an upper arch connected via connecting means and being continuous lengthwise and having centering means; said roof lengthwise carrier and said upper arch having two-shell hollow sections; an upper lengthwise surface of said upper arch having a roof-shaped centering surface and lengthwise continuous detent grooves, a contact surface of said roof lengthwise carrier having a recess for serving as corresponding centering surface to at least part of

the length of said upper arch; said recess having lengthwise extending detent tongues substantially matching said detent



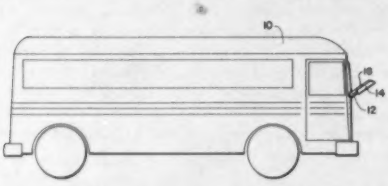
grooves; said upper arch and said roof lengthwise carrier having associated tongues on the inside for suspending a panel.

4,158,466

INSECT DEFLECTOR FOR AUTOMOTIVE VEHICLES

H. Allen Ramsay, Box 311, Orangewood Apt. 444, Orange Grove Rd., Tucson, Ariz. 85704

Filed May 12, 1976, Ser. No. 685,509
Int. Cl.[2] B62D *35/00*
U.S. Cl. 296—91 **1 Claim**



1. An insect deflector for use on automotive vehicles, comprising:

a centrally hinged deflector,

an adjustable mounting strip attached to each distal end of the deflector,

a bracket attachable to a side of a vehicle adjacent to a lower edge of a window of the vehicle,

the bracket forming a hook for attachment to a distal end of one of the adjustable mounting strips,

the adjustable mounting strip secured to the deflector by an adjustable strap,

the deflector made of a transparent material, the adjustable mounting strip made of a plastic material,

a means of positioning the deflector in front of the window is a first attachment securable to a bottom edge of the window, and a second attachment securable to the deflector and engaging the first attachment, whereby the space between the window and the deflector may be maintained,

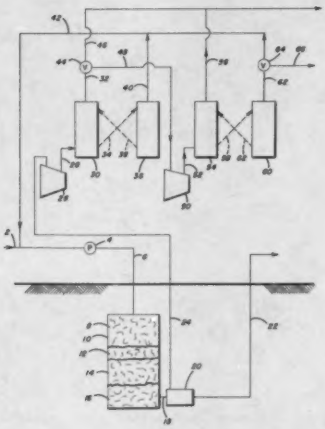
a reinforcement is attached to the hinge, whereby the strength of the deflector may be maintained while adjusting the angle of the deflector, and the adjustable mounting strips are made of a metal material.

4,158,467

PROCESS FOR RECOVERING SHALE OIL

Olaf A. Larson, Pittsburgh, Pa., and Charles W. Matthews, Denver, Colo., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1977, Ser. No. 865,916
Int. Cl.[2] E21B *43/24*; E21C *41/10*
U.S. Cl. 299—2 **13 Claims**



1. An improved in-situ retorting process for recovering shale oil from a subsurface oil shale deposit and producing a gas of low sulfur content and increased heating value comprising the steps of:

(1) mining a first portion of said shale to form a void space in the shale deposit;

(2) fragmenting a second portion of said shale and expanding said second portion into the void space to form a rubblized in-situ retort;

(3) retorting the rubblized shale in the retort by passing downwardly through the retort a molecular oxygen supplying gas while maintaining a retort temperature adapted to convert kerogen in shale in the retort to shale oil and to produce an offgas containing carbon dioxide, hydrogen sulfide, gaseous hydrocarbons and other combustion and inert gases;

(4) separating said shale oil from said offgas;

(5) separating hydrogen sulfide and a first portion of said carbon dioxide from said offgas to produce a clean fuel gas of low sulfur content and increased heating value; and

(6) recycling the separated hydrogen sulfide and carbon dioxide to step (3).

4,158,468

VEHICLE SAFETY WHEEL

Melvin L. Bass, 2262 Kaydel St., Whittier, Calif. 90601, and Wesley E. Buford, 1042 Wingate, Covina, Calif. 91723

Filed Sep. 22, 1977, Ser. No. 835,634
Int. Cl.[2] B60C *17/00*
U.S. Cl. 301—39 T **9 Claims**

3. A vehicle safety wheel comprising:

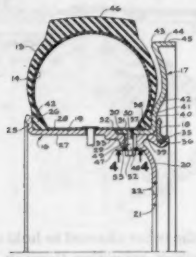
a wheel body having a rim portion about which an inflatable tire is to be received, and having a mounting flange portion extending generally radially inwardly from said rim portion for connecting the wheel body to a vehicle;

a safety flange detachably secured to said body and extending generally radially outwardly at a side of the tire to a peripheral edge of a diameter slightly less than the external diameter of the tire to engage a road surface and support the vehicle upon deflation of the tire;

said safety flange having a bead retaining portion near the rim portion of the wheel body which extends generally

radially adjacent the tire and engages a bead of the tire in an abutting relation retaining that bead against axial expanding movement;

said safety flange having an additional portion rigidly connected to an inner edge of said generally radially extending bead retaining portion and turned to extend generally axially at a radially inner side of said bead of the tire and



radially between that bead and an outer surface of said rim portion of the wheel body; and

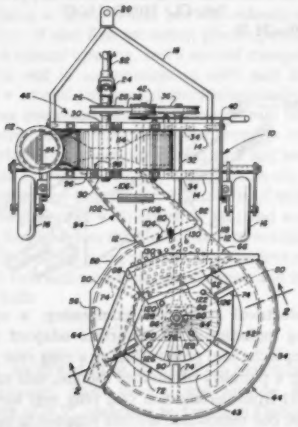
a resilient retaining ring formed separately from said safety flange and receivable within a groove in said rim portion of the wheel body and engageable with an outer side of said bead retaining portion of the safety flange in a relation blocking axial movement thereof.

4,158,469

FEED MATERIAL HANDLING APPARATUS

Roger L. Risser; Arthur L. Kelsey, both of Leola, and Thomas L. Stiefvater, New Holland, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 22, 1977, Ser. No. 826,377
Int. Cl.[2] B65G *53/40*
U.S. Cl. 406—89 **1 Claim**



1. In a forage blower system for receiving crop material from a forage wagon and for directing the same in at least partially airborne manner to a blower which blows and throws the airborne material upwardly through a transition member to a silo or the like, said system comprising:

(a) a frame,

(b) a substantially horizontal rotary feed table including a substantially horizontal bottom and a substantially vertical sidewall having a discharge opening therein connected to said bottom to provide a hopper on said frame having a horizontal top,

(c) a rotary impeller supported within said hopper for rotation about a substantially vertical axis and including radial impeller blades spaced a limited distance at the tips from the sidewall of said hopper and operable to engage said crop material,

(d) a discharge tunnel extending substantially tangentially and horizontally from said discharge opening in said sidewall of said hopper and having a top plate,

(e) a blower having a housing supported by said frame and provided with substantially vertical sidewalls parallel to each other and an impeller therein rotatable about a substantially horizontal axis, one of said sidewalls having an inlet opening communicating with the discharge end of said tunnel to receive crop material therefrom and said housing having a tangential transition discharge member communicating with a port in said housing, and

(f) drive means for said impellers of said feed table and blower and operable to drive the impeller of said blower at a substantially greater speed than the impeller of said feed table;

the improvement comprising:

(g) a horizontal cover member extending across the top of said hopper from one edge of said top plate of said tunnel to a portion of the sidewall less than half the circumference of said sidewall and the inner edge of said cover member being spaced from the axis of said hopper, and

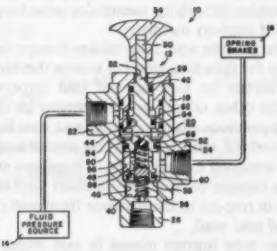
(h) a plurality of permanently open air inlet vent holes in said horizontal cover member at least in the portion thereof nearest the inlet end of said tunnel and extending over an area substantially as wide as said tunnel and operable to introduce air constantly to said tunnel and thereby render the disintegrated forage material airborne as it passes via said tunnel into said blower.

4,158,470

SPRING BRAKE HOLD-OFF SYSTEM

James P. Koenig, Olmsted Township, Lorain County, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

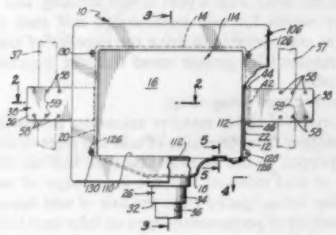
Filed Feb. 16, 1978, Ser. No. 878,202
Int. Cl.[2] B60T *13/22*
U.S. Cl. 303—71 **11 Claims**



1. Fluid pressure control valve for a fluid pressure system including a fluid pressure source and a pressure responsive device comprising a housing having an inlet communicated to said fluid pressure source, an outlet communicated to said pressure responsive device, and an exhaust, control valve means slidably mounted within said housing and actuable from a first position venting said outlet to said exhaust and closing said inlet to a second position closing said exhaust and communicating the inlet with the outlet, and check valve means controlling communication between the inlet and the outlet when the control valve means is in the second position to permit substantially uninhibited communication from the inlet to the outlet and to prevent communication from the outlet to the inlet, said housing defining a cavity therewithin communicating with said inlet, outlet and exhaust, said control valve means including a portion slidably and sealingly engaging the wall of said cavity between the inlet and outlet to prevent communica-

tion therebetween around said control valve means, and passage means within said control valve means extending across said portion so that the inlet and outlet may be communicated through said passage means when the control valve means is in the second position.

4,158,471
WASHING MACHINE OUTLET BOX
Duane D. Logsdon, Fullerton, Calif., assignor to The Logsdon Foundation, Stanton, Calif.
Filed Mar. 27, 1978, Ser. No. 890,525
Int. Cl.[2] A47B 77/06; F16L 5/00
U.S. Cl. 312—229 **13 Claims**



1. A washing machine outlet box capable of fitting within a wall and attaching to support members in that wall of the type having an integrally formed, water impervious plastic cabinet wherein said cabinet has a top, a back, sides, a front opening and a bottom, said bottom having a generally funnel-like shape terminating in a bottom drain opening, the improvement which comprises:

detachably mounted drain means;

said detachably mounted drain means including a first coupling means on said bottom of said plastic cabinet and a pipe-like extension having a second coupling means on one end thereof;

said first coupling means interlocking with said second coupling means to form a water-tight seal between said bottom of said plastic cabinet and said pipe-like extension;

variable position attaching means for attaching said outlet box to said support member;

said variable position attaching means comprising two holding means for fastening bracket means thereto, one of said holding means on one side of said impervious plastic cabinet the other of said holding means on the other side of said impervious plastic cabinet and two bracket means which interlock with said holding means and are capable of being attached to said support members such that said cabinet is capable of fitting within said wall in at least two positions in respect to the distance from said cabinet to the surface of said wall;

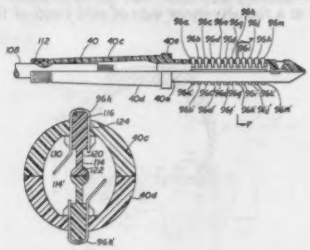
multiple size pipe ingress means in said impervious plastic cabinet.

4,158,472
PATCH MODULE
Lewis J. Seiden, Tappan, N.Y., and Joseph P. Magnano, Norwalk, Conn., assignors to T-Bar, Incorporated, Wilton, Conn.
Division of Ser. No. 810,923, Jun. 29, 1977. This application Apr. 6, 1978, Ser. No. 894,104
Int. Cl.[2] H01R 11/18
U.S. Cl. 339—19 **7 Claims**

1. A wand structure for use in connection with a patch unit receptacle and associated contacts and circuitry comprising,

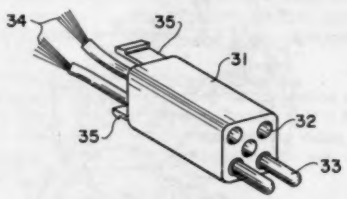
a generally hollow cylindrical structure consisting of mating cylindrical channels such that, when the structure is assembled, contacts extend through the channel walls along opposite aligned positions of said cylindrical structure,

contacts are supported on insulating contact support members to extend from within the hollow cylindrical structure through holes in the channel walls, said contact support members providing shoulders abutting the backside of the cylindrical channels and being arranged so that the contact support member bears against the contact support



member for the other channel to hold one another in place with the contacts extending through the holes in the assembled channels and beyond with the wand portions assembled together whereby the two contact support members hold the contacts in operating position.

4,158,473
CONVERTIBLE CYLINDRICAL ELECTRICAL CONNECTOR
Jack F. Shearer, Lake Bluff, Ill., assignor to Akzona Incorporated, Asheville, N.C.
Continuation of Ser. No. 663,954, Mar. 4, 1976, abandoned. This application Oct. 18, 1977, Ser. No. 843,101
Int. Cl.[2] H01R 13/42
U.S. Cl. 339—31 R **16 Claims**

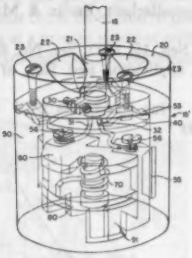


1. An electrical connector comprising: a cylindrically-shaped plug including a front surface adapted to engage a mating receptacle; said plug including a plug rear surface, said plug having a plurality of cavities therein, said cavities being open on said front surface and said plug rear surface on said plug; at least one removable module adapted to be received in said cavities, said module having at least one hole therethrough for receiving an electrical contact; said cavities in said plug being adapted to receive various types of said module having various numbers of holes and contacts whereby a single plug may be used for a plurality of electrical connector functions; at least one recess located in each of said cavities a predetermined distance from said front surface of said plug; at least one tab protruding from the rear surface of said module for engaging said recess, thereby restricting the movement of said module towards the front of said plug; said tab being integral with said module; said tab being exposed to said rear plug surface for ease of removal of said module from said plug.

4,158,474
LIGHT BULB AND SOCKET COMBINATION

Richard MacGraw, II, 600 W. 113th St., New York, N.Y. 10025

Filed Jun. 29, 1977, Ser. No. 811,437
Int. Cl.[2] H01R 17/06, 17/22
U.S. Cl. 339—135 12 Claims



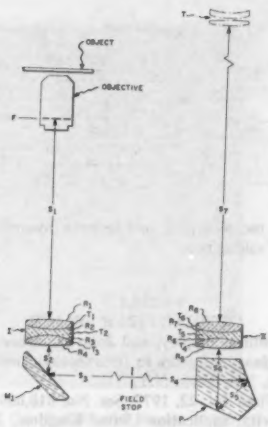
1. A light socket and bulb combination comprising a top cover plate having a central aperture for receipt of an electrical cord, a first mounting piece comprising means for removably securing said top cover plate thereon, an enlarged central opening formed from the top surface of said first mounting piece downwardly to near the bottom surface thereof, a first metal terminal and a second metal terminal diametrically opposite said first metal terminal, said first mounting piece being made of a plastic and each of said first and second metal terminals having at least a portion thereof cast into the plastic and a portion open to said central opening for attachment to said electrical cord, a second mounting piece integral with said light bulb and having filament contacts comprising prongs extending outwardly of said second mounting piece, means extending through the bottom surface of said first mounting piece for receiving the contacts of said light bulb, said means for receiving the contacts of a light bulb comprise a pair of diametrically opposed circumferential slots, each of said pair of slots comprising a first vertical portion extending from the bottom surface of said first mounting piece upwardly toward said enlarged central opening, and a second triangular portion having a first end in communication with said first vertical portion and a second end spaced circumferentially about said first mounting piece and adjacent to one of said first and second metal terminals so that when said prong is inserted into one of said slots it contacts one of said first and second metal terminals, said first and second mounting pieces are removably secured together and the respective contacts of said light bulb are held in engagement with said first first and second metal terminals, whereby when the electrical cord is connected to a power source current is supplied to the filament of the light bulb via said first and second metal terminals and the contacts of the light bulb.

4,158,475
OPTICAL SYSTEM FOR INVERTED MICROSCOPES

Joseph C. Dianett, East Aurora, and Edward B. Rybicki, Depew, both of N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 18, 1978, Ser. No. 897,451
Int. Cl.[2] G02B 23/02
U.S. Cl. 350—50 1 Claim

1. An optical system for extending the distance between a conventional infinity-corrective microscope objective and a telescope lens, which comprise a pair of bi-convex triplets, a mirror, and a pentaprism having the parameters set forth below where lens radii (R_1–R_8), a minus sign (—) indicates the center curvature on the back focal plane side of the surface vertex, lens thicknesses (T_1–T_6), axial spacings along the optical axis of the system (S_1–S_7), refractive indicies (ND_1–ND_6), and Abbe numbers (ν_1–ν_6) are determined by the following relationship, all radii, thicknesses and spacings being in millimeters.



Lens	Radius R	Thickness T	Spacing S	Refractive Index ND	Abbe Number ν
			$S_1=118.9$		
	$R_1=85.285$				
		$T_1=6.0$		$ND_1=1.504$	$\nu_1=66.9$
	$R_2=-52.24$				
I		$T_2=3.2$		$ND_2=1.613$	$\nu_2=44.3$
	$R_3=31.84$				
		$T_3=6.0$		$ND_3=1.589$	$\nu_3=48.7$
	$R_4=-113.24$				
			$S_2=17.2$		
			$S_3=101.0$		
			$S_4=87.9$*		
			$S_5=17.1$**		
			$S_6=26.3$*		
	$R_5=113.24$				
		$T_4=6.0$		$ND_4=1.589$	$\nu_3=48.7$
	$R_6=-31.84$				
II		$T_5=3.2$		$ND_5=1.613$	$\nu_5=44.3$
	$R_7=52.24$				
		$T_6=6.0$		$ND_6=1.504$	$\nu_6=66.9$
	$R_8=-85.285$				
			$S_7=213.6$		

*Optical distance ($\frac{\text{geometric prism distance}}{ND}$ or $\frac{31.385}{1.523}$)

**Optical distance ($\frac{\text{geometric prism distance}}{ND}$ or $\frac{26.000}{1.523}$)

4,158,476
SINGLE OPTICAL FIBER CONNECTOR

Ronald L. McCartney, Orange, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

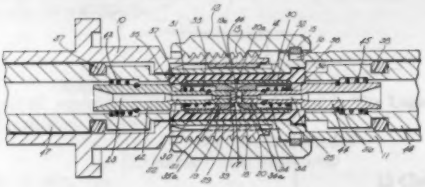
Filed Dec. 16, 1977, Ser. No. 861,110
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 12 Claims

1. A single optical fiber contact comprising:

a set of spheres of equal diameter arranged in closely adjacent, but not necessarily engaging, relationship defining an interstitial space therebetween, the centers of said spheres lying in a first common plane;

first means for supporting a single optical fiber so that the end portion thereof lies in said interstitial space, said

spheres being dimensioned to each engage said optical fiber in said space;



and second means urging said spheres inwardly toward the center of said space.

4,158,477

OPTICAL FIBER SPLICE

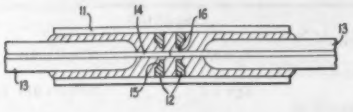
Michael J. Phillips, Shipley, and John D. Archer, Lightcliffe, both of England, assignors to Internatonal Standard Electric Corporation, New York, N.Y.

Filed Jul. 22, 1977, Ser. No. 818,039

Claims priority, application United Kingdom, Jul. 29, 1976, 31623/76

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.21 **6 Claims**



1. A splice arrangement for coupling a pair of optical fibers comprising:

a tubular ferrule for receiving the fibers to be spliced;

a pair of spaced apart watch jewels within said ferrule having a central hole for receiving one end of the fibers to be spliced, such that the fiber ends abut between said spaced apart jewels; and

means for permanently securing the fibers in said ferrule.

4,158,478

COAXIAL OPTICAL FIBRE CABLE

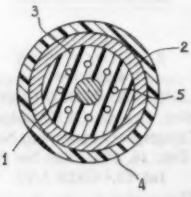
Luigi D'Auria; Daniel Ostrowsky, and Andre Jacques, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jul. 12, 1977, Ser. No. 815,006

Claims priority, application France, Jul. 16, 1976, 76 21816

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.23 **1 Claim**



1. A coaxial cable comprising a central electric conductor, a peripheral electrically conducting screen, a solid dielectric separating from one another said central conductor and said screen and a plurality of optical fibres embedded in said dielectric and distributed between said central conductor and said screen, said optical fibres being arranged symmetrically around the central conductor and at equal intervals from one another.

4,158,479

GRADIENT FIBER

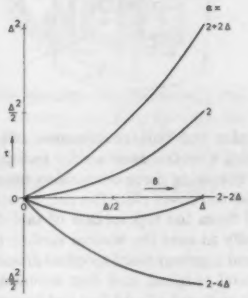
Siegfried Geckeler, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 15, 1977, Ser. No. 833,481

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1976, 2642822

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.31 **1 Claim**



1. A gradient fiber for the transmission of optical waves, said fiber having an index of refraction profile according to

$$n^2_{(r)} = n_0^2(1-2\Delta((r/a)^\alpha - A((r/a)^\alpha - (r/a)^{2\alpha})))$$

wherein n_0 = maximum index of refraction at the center of the fiber,

$n_{(r)}$ = index of refraction at radius r from center of fiber with $0 \leqq r \leqq a$,

$\Delta \approx n_0 - n_{(a)}/n_0$,

$\alpha = 2 - 2P$,

$$A = A_{opt} \approx -\Delta \cdot (1+\Delta) \cdot \left(\frac{\alpha_0 + 1}{\alpha_0}\right),$$

$$P = -\frac{K_0}{\Delta} \cdot \frac{d\Delta}{dk_0} = \frac{1}{\left(1 - \frac{\lambda}{n_0}\frac{dn_0}{d\lambda}\right)} \cdot \frac{\lambda}{\Delta} \cdot \frac{d\Delta}{d\lambda} \approx \frac{\lambda}{\Delta}\frac{d\Delta}{d\lambda}.$$

and

λ = the light wave length.

4,158,480

AUTOMATIC STEREOSCOPE

Edmund Mitchell, 526 S. St. Joseph St., South Bend, Ind. 46601

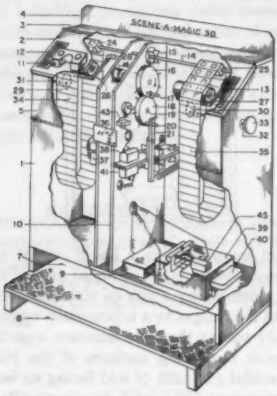
Filed Jun. 20, 1977, Ser. No. 808,402

Int. Cl.² G02B 27/22

U.S. Cl. 350—133 **4 Claims**

1. In the category of automatic stereoscopes, a combination of electro-mechanical parts and sequence of functions designed for a plurality of stereoscopic heads and comprising a multi-vaned "paddle-wheel" keyed onto an idler shaft; a motor-driven sprocket-wheel to propel the "paddle-wheel" intermittently; a second sprocket-wheel rotated in small sectors by a single horizontal rod extending from the rim of the motor-driven sprocket-wheel; a spring-loaded time-delay lever activated by a horizontal trigger-rod on the second sprocket-wheel, operating two switches simultaneously; a hingeably mounted carriage under each stereoscopic head with lamps and reflector, surmounted in the middle by a smooth curved band over which the slide mounts glide into position; a sup-

porting cam-rod-and-knob assembly under each carriage for making focal adjustments; a plurality of stereoscopic heads with loudspeakers adjacent to each viewing head; a means for hinging and combining stereo slides into an endless chain; a wide pulley aligned under each viewing head, with multiple flat surfaces constituting an impeller for the slide reel; an audio system that makes possible the use of any 8-track car stereo, modified to make the sensor retractable, and to permit stopping the movement of the tape at a precise moment without removal of the tape cartridge; a cam-and-switch combination to reduce



the "on" time of the solenoid that brings the sensor into contact with the moving tape; another cam-and-switch combination to limit the "on" time for the tape player's stop-circuit, or alternately a combination of stop-solenoid and spring-loaded time-delay lever, to prevent the sensing patch from locking the circuit electrically on dead center; a cooling fan; a coin acceptor with coin return slot, a non-resetting coin counter, and a blocking solenoid to close the coin slot after the cycle has started; and housing for all components in a cabinet designed to accommodate a plurality of viewing persons of diverse stature.

4,158,481

SYSTEM AND METHOD FOR VIEWING A THREE-DIMENSIONAL IMAGE USING A TWO-DIMENSIONAL DRAWING

Horst W. Hoyer, 165 Watchung Ave., Montclair, N.J. 07043

Filed May 5, 1977, Ser. No. 794,028

Int. Cl.² G02B *27/22*

U.S. Cl. 350—144 **10 Claims**

1. An apparatus for viewing a three-dimensional effect of a two-dimensional figure comprising:

a viewing grating composed of a series of colored and parallel lines in a first plane with transparent areas between said colored lines,

a base figure composed of a series of individual lines which form a figure of non-periodic non-repeating patterns in a second plane and an imaginary horizontal reference line in the second plane and at an angle θ from each of said individual lines, where angle θ may vary for each individual line,

means for holding the viewing grating a distance l above the base figure with the first plane of the grating being substantially parallel to the second plane of the figure and with a grating colored line aligned in parallel with said reference line, said reference line being parallel to and running in the direction of an imaginary temporal line between the viewer's left and right eyes, the distance l being arbitrary but being conveniently taken, thus creating a three-dimensional effect in a plane above or below

the plane of the figure and at an apparent distance $z=\pm(1-\sin\theta)$ therefrom.

4,158,482

INVERTED TELEPHOTO TYPE SUPER-WIDE ANGLE LENS

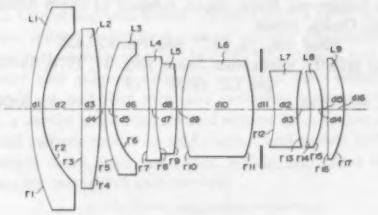
Yoshikazu Doi, and Yutaka Sakai, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Aug. 22, 1977, Ser. No. 826,756

Claims priority, application Japan, Aug. 27, 1976, 51-102433

Int. Cl.² G02B *9/64*

U.S. Cl. 350—214 **4 Claims**



1. An inverted telephoto type super-wide angle lens comprising a negative meniscus lens L1 convex to the front as numbered consecutively from front to rear, a biconvex lens L2, a negative meniscus lens L3 convex to the front, a cemented positive doublet of a negative lens L4 and a positive lens L5, a biconvex lens L6, a biconcave lens L7 the rear surface of which has radius of curvature greater than that of the front surface thereof, a positive meniscus lens L8 convex to the rear, and a positive lens L9, wherein the Abbe dispersion numbers $\nu 4$, $\nu 5$ and $\nu 6$ of said lenses L4, L5 and L6 satisfy the following conditions;

$53<\nu 6<61$, $10<\nu 4-\nu 5<16$.

4,158,483

REMOTE CONTROLLED REARVIEW MIRROR

Robert J. Fisher, Detroit, and Jeffrey R. Seaman, Rochester, both of Mich., assignors to Harman International Industries, Inc., Southfield, Mich.

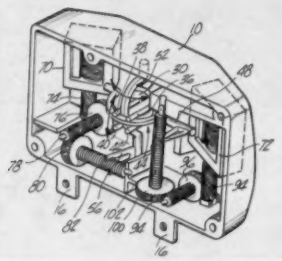
Continuation-in-part of Ser. No. 594,245, Jul. 9, 1975, abandoned. This application Feb. 3, 1976, Ser. No. 655,135

Int. Cl.² G02B *5/08*

U.S. Cl. 350—289 **16 Claims**

1. In a vehicular remote control outside rearview mirror

assembly, first and second cooperating pivot assembly portions, said first pivot portion being rotatable through an angle about each of two mutually perpendicular axes relative to said second portion, a reflective mirror member, means for supporting said reflective mirror member on said first pivot portion for rotation therewith, selectively operable drive means, first and second generally arcuate drive arm means each selectively rotatable through an angle about substantially perpendicular



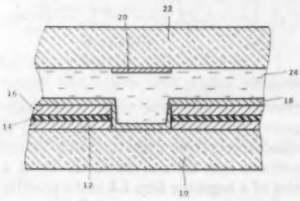
axes by said selectively operable drive means, said drive means including a pair of worms, each rotatable about an individual worm axis, and a worm follower individual to each of said worms and rotatable by the respective worm about an axis spaced from the worm axis of the worm individual thereto, and actuating arm means secured to said first pivot portion and in driving engagement with said first and second drive arm means and effective when selectively driven by said drive arm means to rotate said first pivot portion.

4,158,484

REFLECTIVE TYPE LIQUID CRYSTAL DISPLAY

Mitsuru Nishiyama, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 31, 1977, Ser. No. 829,423
Claims priority, application Japan, Aug. 31, 1976, 51-105138
Int. Cl.² G02F 1/13
U.S. Cl. 350—338 **3 Claims**



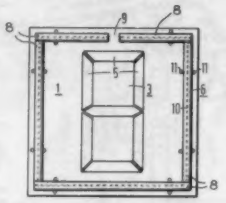
1. A reflective type liquid crystal display comprising:
first and second support plates;
segmented reflective electrodes deposited on said first support plate;
first and second reflective coatings deposited on said second support plate in a region except the region corresponding to said segmented reflective electrodes;
a transparent electrode deposited on said second support plate and said second reflective coatings;
an intermediate layer of insulator material interposed between said first and second reflective coatings, said intermediate layer being capable of preventing a chemical reaction between said transparent electrode and said first reflective coating mounted on said second support plate; and
a liquid crystal composition filled between said first and second support plates.

4,158,485

LIQUID CRYSTAL CELL WITH A GLASS SOLDER SEAL

Werner Mueller, Neu-Germering; Christoph Rotter, and Wolfgang Welsch, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 655,506, Feb. 5, 1976, abandoned. This application Mar. 10, 1978, Ser. No. 885,200
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1975, 2505513
Int. Cl.² G02F 1/13
U.S. Cl. 350—343 **8 Claims**



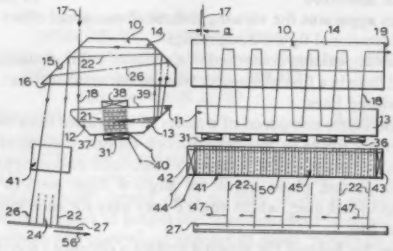
1. A method for producing a liquid crystal cell having a chamber for receiving a layer of liquid crystal material, said chamber being defined by a pair of plate members joined together adjacent their edges by a substantially continuous means for hermetically sealing the plate members together in spaced relationship with the facing surfaces of the plate members being plane parallel and each of said facing surfaces having at least one portion provided with an electrically conducting coating, said means for sealing including a glass solder frame, said method comprising the steps of providing a pair of plate members, providing a glass solder frame on one of said pair of plate members by positioning at least one fiber consisting of a glass solder material free of any organic bonding agent in a predetermined position on a surface and adjacent the edges of said one plate member, placing the other of said pair of plate members with its surface engaging the glass solder frame of the glass solder fiber to form an assembly, and then subsequently heating the assembly to fuse the glass solder fiber to form a hermetic glass solder seal between the two plates to join the plates together to form the chamber defined thereby.

4,158,486

LIGHT BEAM MESSAGE CHARACTER GENERATING SYSTEM

Joseph T. McNarey, 8548 Boulder Dr., La Mesa, Calif. 92041

Filed Oct. 13, 1977, Ser. No. 841,839
Int. Cl.² G02F 1/11
U.S. Cl. 350—358 **4 Claims**



1. In a light deflecting device of the type having a transparent parallelapiped member with a plurality of light reflecting surfaces directing a light beam along a helical path of plural revolutions through the transparent member, said revolutions being side-by-side along a length dimension of said member, at

least first and second transducer means intimately joined to a surface of said member and positioned thereon, side-by-side, in the direction of said length and coinciding, respectively, with first and second revolutions of the helical path along which said light beam is directed, the improvement comprising:

means for connecting ultrasonic frequency voltages, selectively, to said first and second transducer means for establishing correspondingly first and second series of individual light diffraction gratings in said transparent member and effecting, thereby, a redirecting of said light beam away from said helical path and along first and second series of individual secondary paths stemming, respectively, from said first and second series of individual light diffraction gratings, said light along each said secondary path undergoing a succession of light reflections within said plurality of light reflecting surfaces extending to, and thereupon beyond, the light reflecting limits of said plurality of light reflecting surfaces.

4,158,487

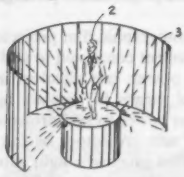
STEREOSCOPIC REAL IMAGE SCANNING REPRODUCTION METHOD AND APPARATUS

Robert B. Collender, 709 Patterson Ave., Glendale, Calif. 91203

Filed Feb. 17, 1978, Ser. No. 878,990

Int. Cl.[2] G03B *19/18, 21/32*

U.S. Cl. 352—38 **2 Claims**



1. A method or recording and reproducing stereoscopic views for observation by plural observers without visual aids at the eyes of said observers, comprising:

photographing multiple sequential views of a scene from a motion picture camera in a manner that the optical axis of the camera effectively rotates about a point in the scene; reproducing said views sequentially by projecting the views from a scanning projector onto a stationary concaved screen; said scanning projector being positioned, during the projection of successive views, at successive positions along the arc of a projection circle; said screen and projection circle being concentric about a common vertical axis; the optical axis of said projector always pointing away from said vertical axis so as to project said views to said screen located on the same side of the circle as said projector; said screen being stationary and comprised of horizontal corrugated ridges to vertically scatter incident light rays from said projector; said projector's effective lens node so corrected in location along the optical axis of said projector for horizontal projection angles that rays projected from said projector at one of said successive positions will reflect from said screen to pass through a vertical aerial exit slit; said slit being parallel to said vertical axis and on an extension of the scanning projector optical axis and at a point on the opposite side of said vertical axis from said scanning projector position; said screen so curved that the picture projected from said projector at one of said successive positions may be viewed in its entirety by an eye located anywhere along said slit; and the scanning rate of said projector being at a rate sufficient to be within the period of persistence of vision of an observer.

4,158,488

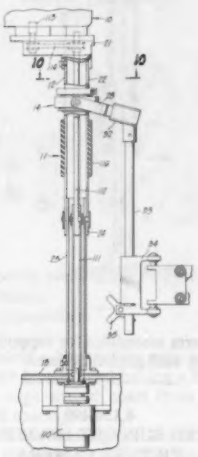
BODY-MOUNTED SUPPORT DEVICE FOR MOTION PICTURE CAMERA

Robert E. Gottschalk, Los Angeles; Felipe Navarro, Granada Hills, and Carl F. Fazekas, Tarzana, all of Calif., assignors to Panavision, Incorporated, Tarzana, Calif.

Filed Jul. 19, 1976, Ser. No. 706,196

Int. Cl.[2] G03B *17/00*

U.S. Cl. 352—243 **3 Claims**



1. In a body-mounted support device of the type described, the combination of: a motion picture camera, an electric motor for driving the motion picture camera, a first vertical tube having an upper end supporting said camera, a sleeve rotatably mounted on said tube, a support element, horizontal pivot means connecting said sleeve to said support element, a body harness, means including a pair of serially connected articulated arm assemblies attached to said body harness and adapted to carry said support element, a second tube telescopically mounted on said first tube and extending downward therefrom, a carrier suspended on said second tube, means supporting said camera motor on said carrier, and means including a telescopic drive shaft positioned within said tubes whereby said motor may drive said camera.

4,158,489

BODY-MOUNTED CAMERA SUPPORT APPARATUS

Robert E. Gottschalk, Los Angeles; Felipe Navarro, Granada Hills, and Carl F. Fazekas, Tarzana, all of Calif., assignors to Panavision, Incorporated, Tarzana, Calif.

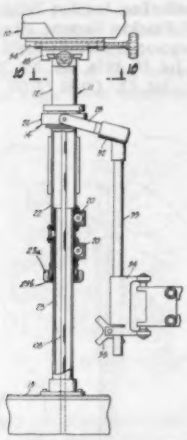
Continuation-in-part of Ser. No. 706,196, Jul. 19, 1976. This application Nov. 11, 1976, Ser. No. 740,781

Int. Cl.[2] G03B *17/00*

U.S. Cl. 352—243 **2 Claims**

1. In a body-mounted support device for a camera, the combination of: an upright support tube member comprising an upper tube, means on said upper tube for supporting a camera, means on the lower tube for supporting a battery carrier, means connecting said tubes for telescopic movement, whereby the distance between the camera and the battery carrier may be changed, adjustable means for clamping said tubes together to maintain the adjusted height of the battery carrier, a body harness, a pair of serially connected articulated

arm assemblies operatively interposed between said gimbal device and said body harness, and resilient means associated



with each of said arm assemblies for supporting the weight of the parts carried by said gimbal device.

4,158,490

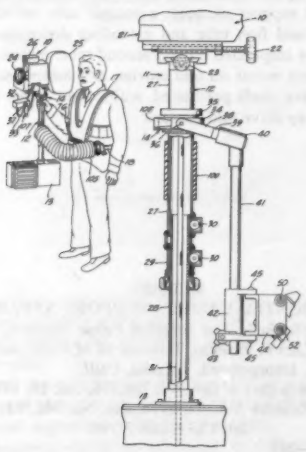
BODY-MOUNTED SUPPORT DEVICE FOR MOTION PICTURE CAMERA

Robert E. Gottschalk, Los Angeles; Felipe Navarro, Granada Hills, and Carl F. Fazekas, Tarzana, all of Calif., assignors to Panavision, Incorporated, Tarzana, Calif.

Continuation-in-part of Ser. No. 740,781, Nov. 11, 1976, which is a continuation-in-part of Ser. No. 706,196, Jul. 19, 1976. This application Jun. 20, 1977, Ser. No. 807,897

Int. Cl.[2] G03B *17/00*

U.S. Cl. 352—243 **10 Claims**



1. In a body-mounted support device for a camera, the combination of: an upright support member, a motion picture camera and a video camera mounted on said member, a gimbal device carrying said member, a video monitor secured with respect to said gimbal device and electrically connected to said video, camera, said monitor having a display screen, electrical switch means mounted in fixed relation with respect to said motion picture camera, visual signal means carried by said video monitor and electrically connected to said switch means, said visual signal means comprising a pair of laterally spaced lamps adjacent said display screen, each lamp being energized by said electrical switch means upon tilting movement of the motion picture camera in one direction, respectively, about its roll axis, and means for adjusting said electrical switch means to change the degree of tilting required to energize said lamps.

4,158,491

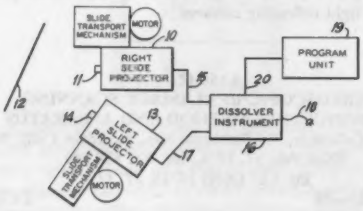
PHOTOGRAPHIC FILM PROJECTION DISSOLVE SYSTEM FOR ARC LAMP PROJECTORS

Eugene Demick, Ridgewood, N.J., and Adrian J. Van Haasteren, Jr., New York, N.Y., assignors to Bergen Expo Systems, Inc., Clifton, N.J.

Filed Dec. 14, 1977, Ser. No. 860,286

Int. Cl.[2] G05D *25/00*; G03B *21/14*

U.S. Cl. 353—90 **13 Claims**



1. A system for the projection of photographic film comprising:

a plurality of photographic film projectors;

a dissolver instrument connected to said projectors and to a source of a.c. power, said dissolver instrument including power control means to regulate by phase control its average output power to said projectors;

at least one of said projectors having an arc lamp light source and a film gate and a light valve means positioned between said arc lamp and said film gate;

said light valve means attenuating the arc lamp light reaching the film from zero to full intensity and changing such intensity at a controlled rate of speed, said light valve means comprising a motor means connected to said dissolver instrument, said motor means having a rotor means whose angle of rotation is linearly related to said average output power, and movement means connected to said rotor means and moved thereby at a controlled rate of speed to relatively open, closed and intermediate positions dependent upon the angular position of said rotor means.

4,158,492

LIGHT RESPONSIVE CIRCUIT

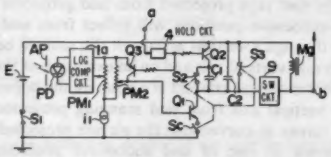
Mashio Kitaura, Tondabayashi, and Nobuyuki Taniguchi, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 30, 1978, Ser. No. 911,050

Claims priority, application Japan, May 30, 1977, 52-63749

Int. Cl.[2] G03B *7/08, 15/05*

U.S. Cl. 354—24 **16 Claims**



1. A light responsive circuit comprising:

a photoelectric element;

a logarithmic compression circuit for generating a first sig-

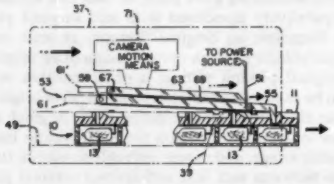
nal proportional to the logarithm of intensity of light incident on said photoelectric element;
means for generating a second signal;
means for combining said first and second signals to produce a third signal;
a logarithmic expansion circuit for generating a fourth signal proportional to the anti-logarithm of said third signal;
means for shifting the level of said third signal to be applied to said logarithmic expansion circuit;
a control circuit responsive to said fourth signal;
means for changing the control characteristic of said control circuit so that said control circuit provides different control characteristics for the same amount of signal applied to said logarithmic expansion circuit; and
means for actuating said means for shifting and said means for changing.

4,158,493

FLASH LAMP ASSEMBLY HAVING HEAT-RESPONSIVE INDEXING MEMBERS

Timothy Fohl, Carlisle, and William E. Hatch, Marblehead, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 6, 1978, Ser. No. 883,453
Int. Cl.² G03B *15/03, 15/02*
U.S. Cl. 354—144 **16 Claims**



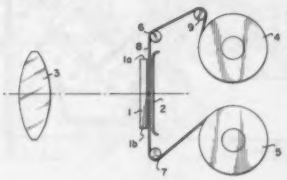
1. A flash lamp assembly for use with a photographic camera having a fixed reflector and a motion means therein adapted for sequentially moving within said camera, said flash lamp assembly comprising:
an elongated housing adapted for being operatively connected to said motion means and for being sequentially advanced within said camera, said housing defining a plurality of juxtapositioned chambers therein and including a base portion and a light-transmitting cover portion adjacent said base portion, said base portion including a plurality of openings therein each located adjacent a respective one of said juxtapositioned chambers and having access thereto;
a plurality of chemical flash lamps positioned within said base portion of said housing and adapted for being aligned with said fixed reflector as said elongated housing is sequentially advanced within said housing, each of said flash lamps including a light-transmitting envelope located within a respective one of said chambers; and
a plurality of heat-responsive cover members each positioned on said base portion over a respective one of said openings within said housing, each of said cover members becoming physically deformed in response to receipt of the heat from the flash lamp located within said chamber adjacent said opening when said flash lamp is activated to permit said sequential advancement of said housing within said camera whereby the flash lamp adjacent said activated flash lamp will become aligned with said fixed reflector.

4,158,494

ROLL FILM CAMERA FOR RENDERING A BEND IN A FILM HARMLESS

Bodo Mielke, Wolfenbüttel, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Fed. Rep. of Germany

Filed Sep. 2, 1977, Ser. No. 830,189
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1976, 2640308
Int. Cl.² G03B *17/00*
U.S. Cl. 354—202 **9 Claims**



1. A roll film camera, particularly a roll film camera adapted for use with a cartridge,
in combination comprising:
a housing,
a film gate including a film picture gate, said film gate being disposed in said housing and having a film inlet edge and a film outlet edge spaced apart from one another at a predetermined spacing,
a lens disposed in said housing on one side of said film gate,
film reel means disposed on the other side of said film gate for holding a film on said film reel means, and for rerouting and stepwise advancing said film through said film gate by an angle exceeding 90°, the film being incrementally advanceable by a film-advance distance, and
a film rerouting roll disposed at a predetermined distance from said film inlet edge, the film being contactable by said film rerouting roll, said film reel means, said film gate and said film rerouting roll defining a film track, said predetermined distance being defined along said film track, and equalling about the film-advance distance and one-half the difference between said film-advance distance and said predetermined spacing, whereby any tendency of the film to form a curvature while in contact with said film rerouting roll is rendered harmless by the film curvature coming to rest outside said film picture gate upon the film being advanced by any multiple of said film-advance distance.

4,158,495

DEVELOPER APPARATUS FOR DIAZOTYPE COPY MATERIALS

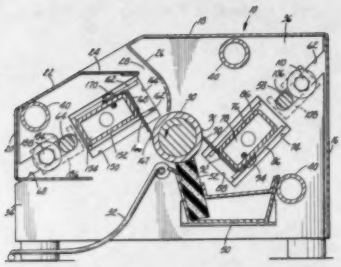
Terry G. Seelenbinder, Elk Grove Village; Walter A. Hudson, Fox River Grove, and Eugene P. Oddo, Mt. Prospect, all of Ill., assignors to AM International, Inc., Los Angeles, Calif.

Filed Jun. 16, 1978, Ser. No. 916,221
Int. Cl.² G03D *5/06*
U.S. Cl. 354—318 **11 Claims**

1. An apparatus for developing diazotype copy material, comprising:
roller means for applying liquid developer to copy material to be developed;
means for applying liquid developer to the roller means;
blade means supported for sliding movement between an inoperative position and an operative position in pressure contact with the roller means for metering the liquid developer on the roller means and for pressing copy material against the roller means for development;
control means operatively associated with the blade means for moving the blade means between the inoperative and the operative positions;

slide means for mounting the blade means adjacent the roller means;

support means for mounting the slide means to maintain the blade means at an angular position with respect to the axis of the roller means;



means for adjusting the support means to position the blade means at a selectively settable position with respect to a longitudinal line of contact of the blade means with the roller means; and

actuating means for manually operating the control means.

4,158,496

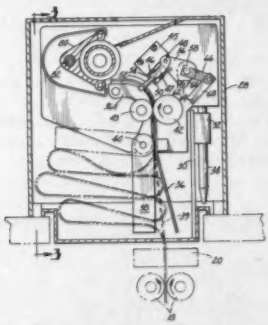
DRY SILVER PROCESSOR FOR PHOTOTYPESETTERS

Ronald J. Cieplik, Mountain Lakes, N.J., assignor to AM International, Inc., Los Angeles, Calif.

Filed May 30, 1978, Ser. No. 910,854

Int. Cl.[2] G03D *3/13*

U.S. Cl. 354—319 **3 Claims**



1. A processor for development of a latent image in a developable encoded web wherein a primary encoder machine has a web feed means to drive the web in a regular procession as it is encoded; comprising:

development means through which the web must be fed at a uniform lineal speed, said means including means for driving a web therethrough;

a threshold web feed means;

a guide system means for directing a web from said threshold feed means to the means for driving the web through the development means;

means for detecting the presence of a web in said guide system means and for shutting down said threshold web feed means in response thereto;

an expansible storage chamber for collecting exposed web delivered to the processor after said threshold web feed means is shut down, and

means to override said means for detecting the presence of a web and reactivate said threshold feed means, thereby delivering the web to the means for moving a web through the development means.

4,158,497

COPYING APPARATUS

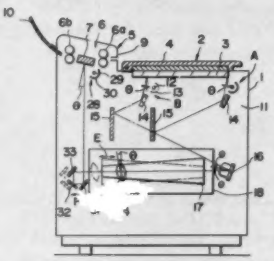
Shigeru Suzuki, Yokohama, and Tatsuo Tani, Tokyo, both of Japan, assignors to Ricoh Co., Ltd., Japan

Filed Aug. 26, 1977, Ser. No. 828,221

Claims priority, application Japan, Aug. 31, 1976, 51-104121; Nov. 12, 1976, 51-135896

Int. Cl.[2] G03B *15/00, 27/34, 27/40, 27/70*

U.S. Cl. 355—8 **11 Claims**



1. A copying apparatus, comprising, in combination, a first original placing station having a contact glass plate for placing a bulky original thereon; a second original placing station having a device for conveying an original in sheet form, and having an illuminating glass plate; at least one slit-illuminating device operatively associated with said original placing stations to illuminate an original thereon; at least one optical system operable to form an optical image of an original placed on an original placing station; a photosensitive member arranged to be exposed to the optical image of an original to form thereon an electrostatic latent image of the original; a developing device operable to develop the electrostatic latent image into a visible image; and means operable to switch the copying operation between said first and second original placing stations; including means operable to vary the degree of magnification of an original placed in said second original placing station by changing the speed of the original conveying device thereof and by moving at least one of an element of said optical system, a surface of the original, and the photosensitive member, whereby to vary the optical path length.

4,158,498

BLADE CLEANING SYSTEM FOR A REPRODUCING APPARATUS

Hitoshi Ohmori, Ebina, Japan, assignor to Rank Xerox Limited, London, England

Filed Jun. 21, 1977, Ser. No. 808,585

Claims priority, application Japan, Jun. 22, 1976, 51/81052[U]

Int. Cl.[2] G03G *21/00*

U.S. Cl. 355—15 **5 Claims**

1. In a reproducing apparatus including:

an imaging surface;

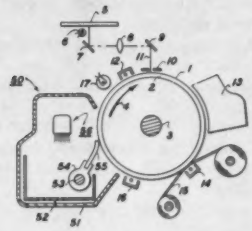
blade means for removing residual material from said surface, the blade means being arranged for reciprocal movement between a first position wherein a cleaning edge thereof engages said imaging surface to remove said residual material, and a second position spaced from said imaging surface; and

means responsive to the movement of said blade means to said second position for removing said residual material from said cleaning edge; the improvement wherein, said apparatus further comprises:

means for holding a supply of lubricating agent; and

means for dispensing said lubricating agent onto said clean-

ing edge of said blade at said second position, said dispensing means being actuated by engagement of said blade



means with said means for removing said residual material from said cleaning edge of said blade.

4,158,499

BUFFER DEVICE FOR THE SCANNING MECHANISM OF AN ELECTROSTATIC COPIER

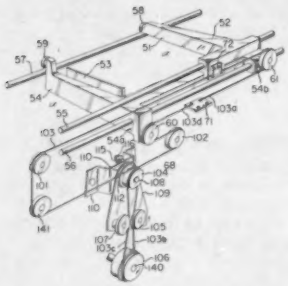
Hiroyuki Hattori, Inagi; Hiroshi Ogawa, Kawasaki; Hirotoshi Kishi, Tokyo; Kazumi Umezawa, and Seiji Sagara, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1978, Ser. No. 886,414

Claims priority, application Japan, Mar. 24, 1977, 52-32576

Int. Cl.[2] G03G *15/28, 15/32*

U.S. Cl. 355—8 **6 Claims**



1. A buffer device for use in an image forming apparatus wherein a reciprocating member is mounted for being reciprocated by a belt, wherein the belt is driven by a rotary member, said device comprising at least two displaceable shock-absorbing rotary elements positioned so as not to interfere with the reciprocating motion of said reciprocating member, and provided so as to engage with mutually facing portions of said belt, and a braking means for friction-suppressing the displacement of said shock-absorbing rotary elements, wherein shock given to said reciprocating member by the forward and reverse rotation of said rotary member is absorbed by displacement of said shock-absorbing rotary elements.

4,158,500

APPARATUS FOR PRODUCING COLLATED COPIES IN PAGE SEQUENTIAL ORDER

Alphonse B. DiFrancesco, Penfield, and Charles T. Hage, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

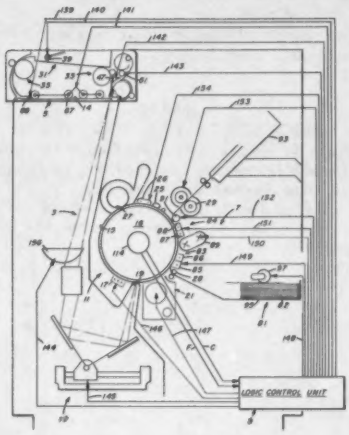
Continuation of Ser. No. 768,666, Feb. 14, 1977, abandoned. This application May 1, 1978, Ser. No. 901,922

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 **21 Claims**

20. A recirculating document feeder for feeding one or more document sheets to an exposure position for copying of the sheets, the feeder comprising:

a document hopper for receiving the document sheets in a set of such sheets, and means for circulating the document sheets, one-after-another, from the bottom of the set in said document hopper to said exposure position for a first presentation, away from and back to said exposure position for a second presentation, and then to the top of the



set in said document hopper, said circulating means including means for inverting the respective document sheets zero or an even number of times between said hopper and the first presentation at said exposure position, an odd number of times between the first and second presentations to said exposure position, and an odd number of times between the second presentation at said exposure position and said document hopper.

4,158,501

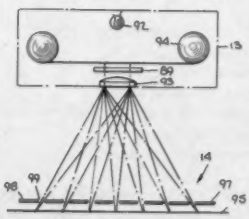
PROJECTION PRINTING METHOD AND APPARATUS

Edgar C. Smith, Long Island City, and James B. Campbell, New York, both of N.Y., assignors to The Three Dimensional Photography Corporation, Westchester, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,759

Int. Cl.[2] G03B *35/00, 27/52, 27/32*

U.S. Cl. 355—77 **45 Claims**



1. A method of processing film images for making a stereogram comprising the steps or providing a plurality of film frame images of the same subject, each frame being marked to identify homologous points for the images to establish an aim point for each image,

providing a line grid having alternating opaque and transparent portions of a defined width superimposed over photosensitive printing paper;

using the mark to optically project a first film image so as to place the aim point at a given location on the printing

paper and expose on the paper a first portion of the first film image equal to the width of the transparent portion of the line grid while maintaining the line grid stationary;

using the mark to optically project a second film image so as to place the aim point at the given location and expose on the paper a second portion of the second film image equal to the width of the transparent portion of the line grid while maintaining the line grid stationary after causing a linear incremental relative movement between the line grid and the paper;

repeating sequentially the last mentioned step foe each remaining film frame image.

4,158,502

DEVICE FOR TESTING STRUCTURES

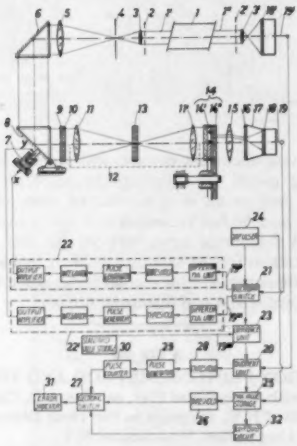
Egon Greiner; Karl-Heinz Mockel, and Gunter Thorwirth, all of Jena, German Democratic Rep., assignors to Jenoptik Jena G.m.b.H., Jena, German Democratic Rep.

Filed Jan. 2, 1976, Ser. No. 646,198

Claims priority, application German Democratic Rep., Feb. 24, 1975, 418435

Int. Cl.[2] G06K *9/08*; G01N *21/32*; G02B *5/18*

U.S. Cl. 356—71 **12 Claims**



1. A device for testing structures comprising

a radiation source for emitting an electro-magnetical radiation in two directions along a first and a second path of rays,

in said first path of rays being arranged in the direction of light propagation:

a first optical imaging means

a first beam directing means

both means being adapted to form a substantially parallel paths of rays,

a first transmissive means, including a structure to be tested,

a correlator system comprising a first lens,

a second transmissive means including a Fourier transformation of said structures,

and a second lens,

said second transmissive means being arranged in the common projection plane of said first and said second lens,

at least one displaceable aperture means being arranged for scanning the Fourier transformation image,

a second optical imaging means, including a third transmissive means including a diffusing lens, located in the projection plane of said second optical imaging means,

a first light electrical detector,

and further comprising electrically connected to said first light electrical detector,

a first electronical switch,

a difference forming means, being connected to said first electronical switch,

a quotient forming means, being connected to said difference forming means,

a first threshold, connected to said quotient forming means,

a pulse generator, connected to said first threshold,

a pulse counting circuit, connected to said pulse generator,

a second electronical switch, connected to said pulse counting circuit, and

an error indication unit, connected to said second electronical switch,

a maximum value storage connected to said quotient forming unit,

a second threshold,

an intensity analysing circuit,

said second threshold and said intensity analysing circuit being connected to said maximum value storage, and having a direct connection to said second electronical switch

an impulser being connected to said first electronic circuit and to said maximum value storage,

and a standard value storage connected to said difference forming means,

in said second path of rays being arranged in the direction of light propagation:

a third optical imaging means,

a second light electrical detector,

said second light electrical detector being connected to said quotient forming means.

4,158,503

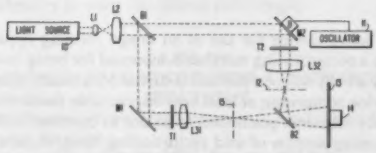
HETERODYNE OPTICAL CORRELATOR

N. Balasubramanian, Acton, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 30, 1977, Ser. No. 838,288

Int. Cl.[2] G06K *9/08*

U.S. Cl. 356—71 **11 Claims**



1. A method for determining parallax by deriving a correlation coefficient responsive to amplitude transmittance of images on a transparency stereo pair with increased signal to noise ratio comprising the steps of:

(a) illuminating said stereo pair with at least common intense monochromatic illumination and forming an image of each in a common image plane,

(b) simultaneously with step (a) linearly modulating the optical path length at a time rate from source to one of said transparencies,

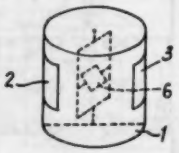
(c) detecting responses from an optical detector in said common image plane occurring at a frequency V/λ wherein λ is the wavelength of said illumination and V is said modulation rate, and

(d) repeating steps a–c for various relative positions of said transparencies and determining parallax by the relative offset resulting in maximum coefficient value.

4,158,504
OPTICAL SIGHTING DEVICES

Dominique de Pontevés, Flers; François J. Naussac, Paris, and André Dujols, Rueil Malmaison, all of France, assignors to Societe de Fabrication d'Instruments de Mesure (S.F.I.M.), Massy, France

Filed Sep. 27, 1976, Ser. No. 727,120
Claims priority, application France, Oct. 1, 1975, 75 30033
Int. Cl.[2] G01J *5/04*
U.S. Cl. 356—247 **10 Claims**



1. An optical sighting device comprising
(a) a rotatable hood;
(b) a first window in said hood made of a material transmitting radiation in a first predetermined range of wavelengths;
(c) a second window in said hood made of a material transmitting radiation in a second predetermined range of wavelengths;
(d) a reflecting device capable of receiving radiation in either said first or said second range of wavelengths through the associated window and to reflect it parallel to the axis of rotation of said hood;
(e) means to rotate said hood relative to said reflecting device to adjust either one of said windows in a working position whereby radiation is transmitted through said window to said reflecting device; and
(f) means for rotating said reflecting device about said axis for sighting purposes and for rotating said hood as required for maintaining said window in its working position.

4,158,505
SPECTRUM ANALYZING SYSTEM WITH PHOTODIODE ARRAY

Einar S. Mathisen, Poughkeepsie; Paul A. Schumann, Jr., Wappinger Falls, and Alvin H. Tong, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,810
Int. Cl.[2] G01J *3/06, 3/42*
U.S. Cl. 356—308 **8 Claims**

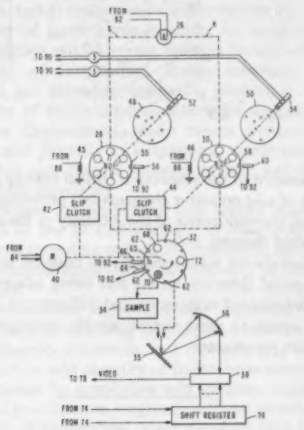
1. In a spectrophotometer having a source of polychromatic light, light detector means, and optical means defining sample and reference paths for transmitting light from said source to said detector means said sample path being adapted to receive a sample whereby light traversing such path indicates such sample and thereafter is transmitted along the remainder of said sample path, said reference path conducting light from said source for analytical comparison of such light with light from the sample, said optical means including means for dispersing light being transmitted along said paths whereby said detector provides output signals representing spectral energy distribution of light received thereby, the combination comprising:

a continuously rotating member disposed across said paths and operative to control the transmission of light therealong from said source to said detector means, said member repetitively defining during each complete rotation thereof a first period during which light is transmitted along the entire length of said sample path, a second period during which light is transmitted along the entire length of said reference path, and a third period during which light is blocked from transmission along the entire lengths of both of said paths;

timing means responsive to movement of said member and operative to provide repetitive timing signals corresponding to said first, second and third periods;

said dispersing means being fixed and operative to direct light dispersed thereby onto said detector means;

said detector means comprising a self scanning photodiode array having a plurality of photodiodes disposed in a linear array in the path of light dispersed by said dispersing means, said array being operated in response to said timing signals to provide during the course of rotation of said member first and second series of discrete analog signals respectively during said first and second periods



representing the spectral energy distribution of light incident thereon from respectively said sample and said reference paths and a third series of signals during said third period representing dark current values of each of said photodiodes, each of said photodiodes being associated with light energy of a different and predetermined wavelength; analog-to-digital conversion means connected to receive said signals from said detector means and provide digital signals corresponding thereto, said conversion means being operated in synchronism with operation of said array to provide said digital signals during said first, second and third periods;

and digital calculating means operative to receive said digital signals and calculate colorimetric properties of a sample.

4,158,506
AUTOMATIC DETERMINATION OF THE POLARIZATION STATE OF NANOSECOND LASER PULSES

Edward Collett, Lincroft, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 15, 1977, Ser. No. 852,178
Int. Cl.[2] G01J *4/04*
U.S. Cl. 356—365 **10 Claims**

1. A system for determining the polarization state of a pulse of optical energy in terms of Stokes parameters, comprising in combination:

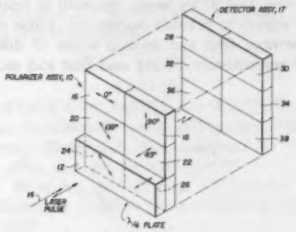
a plurality of polarizer elements, having respective predetermined angles of transmissivity θ relative to a reference axis, arranged to commonly receive incident radiation of said pulse optical energy on the same wavefront without splitting;

wherein at least two of said plurality of polarizer elements

have angles of transmissivity which are mutually orthogonal in a first orientation,

means placed intermediate a selected number of said plurality of polarizer elements and said pulse to introduce a phase shift ϕ into one orthogonal component of said pulse, said pulse being adapted to be resolved into at least one pair of orthogonal components;

a respective plurality of optical detector means located relative to said plurality of polarizer elements so as to be



responsive to the respective optical energy passing out of each of said polarizer elements and providing an electrical signal corresponding to the intensity of the optical energy incident thereto; and

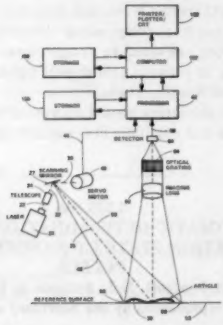
electrical circuit means selectively coupled to said plurality of optical detector means and being adapted to provide predetermined summation and differencing of said electrical signals to yield output signals corresponding to said Stokes parameters.

4,158,507

LASER MEASURING SYSTEM FOR INSPECTION

David P. Himmel, Dallas, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Filed Jul. 27, 1977, Ser. No. 819,311
Int. Cl.[2] G01B *11/24*
U.S. Cl. 356—376 **5 Claims**



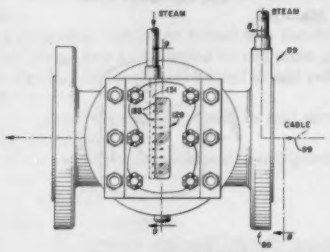
1. A laser system for measuring surface contours of an article wherein a laser beam is scanned across the article and light reflected from the surface of the article passes through an optical system onto an optical detector, characterized by: an optical grating interposed between the optical system and the optical detector in a manner so that the light reflected from scanned areas of the article pass through the optical grating, and reflections from areas of different or changing rate of contour pass through the optical grating at different time intervals; and means for measuring the time interval data of light passing through the grating to determine areas of different contours.

4,158,508

SIGHT GLASS AND PRODUCT CLEANING SYSTEM

David R. Durant, White Plains, N.Y., assignor to Jacoby-Tarbox Corporation, Yonkers, N.Y.

Filed May 16, 1977, Ser. No. 797,177
Int. Cl.[2] G01B *11/10*; G01N *1/34*; B08B *3/02*
U.S. Cl. 356—385 **1 Claim**



1. A system for measuring the true outer diameter of a cable, including a stationary chamber having oppositely disposed apertures in opposite walls thereof, said cable being positioned in the chamber between the apertures, oppositely disposed window units in opposite sides of said chamber in line with said apertures therein and spaced from said chamber making the interior thereof visible from the exterior of said chamber, said cable being positioned between said window units, said window units including oblong shaped elements which are formed of transparent material, the interior of said chamber being subjected to steam, mounting means for connecting said window units to said chamber in spaced relation thereto and said mounting means includes a steam injection unit comprising a pipe extending into said area and extending therein to substantially the lower end of said oblong shaped transparent element, said pipe including a series of spaced apart perforations in the length thereof adjacent to said oblong shaped transparent element, the perforations being directed toward said oblong shaped transparent element directing steam in a linear pattern thereagainst said cable having had insulation applied thereto in a saturated steam atmosphere and mechanism connected to said cable causing travel thereof from and out of the saturated steam atmosphere and through said chamber, said cable traveling through said chamber at any point therein within the projected plane of said transparent oblong shaped element, whereby said cable will be visible at any such point through said transparent oblong shaped element.

4,158,509

INSTRUMENT FOR MEASURING LENGTHS

Heinz Rieder, Ostermiething 154, and Max Schwaiger, Ostermiething 298, both of Austria

Filed Jul. 27, 1977, Ser. No. 819,568
Claims priority, application Austria, Aug. 19, 1976, 6175/76
Int. Cl.[2] G01B *11/02*
U.S. Cl. 356—395 **13 Claims**

1. An instrument for measuring lengths, which comprises

a scale assembly provided with a scale which has a predetermined scale increment and consisting of a plurality of sections each of which is provided with a length portion of said scale and which are separated by joints having in the longitudinal direction of said scale a width that is smaller than a predetermined width,

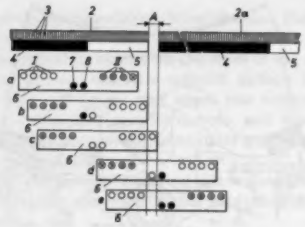
a measuring slide, which is movable along said scale,

first and second photoelectric sensor means carried by said slide and spaced apart along said scale by a distance which exceeds said predetermined width, each of said sensor means being adapted to be enabled and when enabled being adapted to photoelectrically scan said scale and to deliver a predetermined number of length signals in re-

sponse to the movement of said slide along said scale to the extent of each of said increments,

integrating means for integrating said length signals from each of said sensor means which are enabled,

a change-over switch which is shiftable between first and second states and arranged to enable said first and second



sensor means in said first and second positions, respectively, and

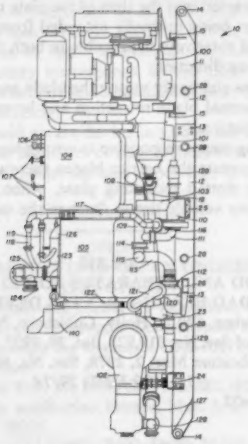
control means carried by said slide and arranged to shift said change over switch from either of said states to the other in response to the movement of said sensor means which are enabled at a time to one of said joints.

4,158,510

CEMENTING SKID WITH RECIRCULATING MIXER

Lance G. Smith, and Jerry N. Knoll, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 24, 1978, Ser. No. 889,783
Int. Cl.[2] B01F *15/00*
U.S. Cl. 366—16 **24 Claims**



12. A machinery skid frame for use as a cementing skid unit having positive displacement pump means, engine means for driving said positive displacement pump means, fluid measuring tank means, recirculating mixing system means, supply pump means, recirculating pump means and auxiliary engine means for driving said supply pump means and said recirculating pump means, said machinery skid frame comprising:

a plurality of longitudinal frame members located in close proximity to each other for mounting said positive displacement pump means, said engine means, said fluid measuring tank means, said recirculating mixing means, said supply pump means, said recirculating pump means and said auxiliary engine means thereon, each longitudinal frame member comprising:

a plurality of members releasably secured to each other to facilitate disassembly of said machinery skid frame into a plurality of sections, one section having said positive displacement pump means thereon, another section having said fluid measuring tank means, said recirculating mixing means, said recirculating pump means, said supply pump means, and said auxiliary engine means thereon, and a remaining section having said engine means thereon;

a plurality of frame cross-members for supporting said engine means thereon located above said plurality of longitudinal frame members at one end thereof, secured thereto and extending outwardly therefrom;

a plurality of frame cross-members for supporting said fluid measuring tank means thereon located above said plurality of longitudinal frame members, secured thereto, and extending outwardly therefrom;

a plurality of frame cross-members for supporting said recirculating mixing means thereon located above said plurality of longitudinal frame members, secured thereto, and extending outwardly therefrom;

a plurality of frame cross-members for supporting said positive displacement pump means thereon located above said plurality of longitudinal frame members at the other end thereof, secured thereto, and extending outwardly therefrom;

support means for supporting said supply pump means secured to one of said plurality of longitudinal frame members, extending outwardly therefrom, and mounted in a horizontal plane below said plurality of frame cross-members;

support means for supporting said recirculating pump means secured to a longitudinal frame member, extending outwardly therefrom, and mounted in a horizontal plane below said plurality of frame cross-members; and

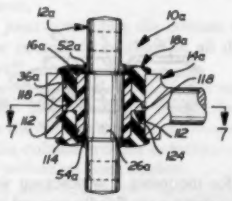
support means for supporting said auxiliary engine means secured to a different longitudinal frame member of said plurality of longitudinal frame members than the longitudinal frame member having said support means for said supply pump means secured thereto, extending outwardly therefrom, and mounted in a horizontal plane below said plurality of frame cross-members.

4,158,511

PIVOT JOINT

Edward J. Herbenar, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 837,395, Sep. 28, 1977. This application Jul. 19, 1978, Ser. No. 926,521
Int. Cl.[2] F16C *11/00*; F16D *1/12*
U.S. Cl. 403—113 **13 Claims**



1. A pivot joint comprising a housing at least partially defining a chamber, a tiltable and rotatable stud extending into said chamber, a resilient bushing at least partially disposed in said chamber and circumscribing said stud to hold said stud against sidewise tilting movement, said bushing being resiliently compressible to enable said stud to be moved sideways against the influence of said bushing, and a bearing disposed between said stud and bushing and circumferentially stressed in tension by said stud to provide a preload force resisting rotation of said stud relative to said bearing, said bearing having stop means for

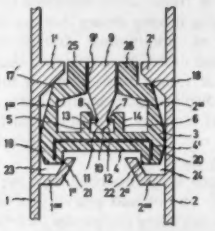
engaging said housing to limit sidewise tilting movement of said stud.

4,158,512

CONNECTOR FOR SPACED METAL PARTS

Wilhelm Hasselbacher, 8530 Neustadt, Aisch, Fed. Rep. of Germany

Filed Aug. 19, 1977, Ser. No. 826,150
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2639113; Apr. 4, 1977, 2715007
Int. Cl.² E04B *1/62*
U.S. Cl. 403—294 **9 Claims**



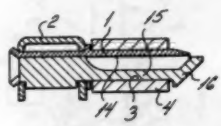
1. A connector for spaced metal parts comprising a hollow elongate body of a cross-sectional shape including at least one bottom wall portion, side wall portions adjoining said bottom wall portion and having rounded protruberances for engagement with said metal parts, and upper wall portions connected to said side wall portions; and a separate fastening strip for insertion in said elongate body to enlarge the same and engage it with said metal parts, said strip having the cross-sectional form of a wedge which in the operative position is engaged between said upper wall portions and is in contact with said bottom wall portion.

4,158,513

DEVICE FOR SECURING A WIPER BLADE TO AN ARM

Maurice A. Journée, Reilly, France, assignor to Paul Journée, S.A., Courbevoie, France

Division of Ser. No. 711,917, Aug. 5, 1976, Pat. No. 4,083,642. This application Oct. 3, 1977, Ser. No. 839,147
Int. Cl.² B25G *3/00*
U.S. Cl. 403—316 **2 Claims**



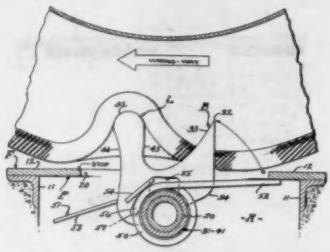
1. A device for mounting a windscreen wiper blade on a pivotal arm comprising a pin fixedly secured to and projecting from one of said blade and arm, a pin receiving opening in the other of said blade and arm, said pin being provided with releasable locking means adapted to cooperate with the end of said pin receiving opening opposite to the end through which said pin is introduced into that opening and operable to secure said arm and blade together and to release said arm and blade and wherein said pin comprises an elastic finger member defining in part a longitudinal bore of said pin and terminating in a hook which projects out of said pin, said hook constituting said locking means.

4,158,514

SAFETY TRAFFIC CONTROLLER

Harry D. Dickinson, 1681 Larco Way, Glendale, Calif. 91202

Filed Jun. 16, 1978, Ser. No. 916,207
Int. Cl.² E01F *13/00*
U.S. Cl. 404—6 **44 Claims**



31. An above grade traffic controller permitting traffic flow in a one-way direction while preventing traffic flow in an opposite wrong-way direction, and including:

a low profile support to be transversely superimposed upon a pavement surface over which vehicular traffic is to pass and comprising, a pair of spaced rails secured to said pavement surface, there being an upwardly open channel between said secured rails;

a slotted plate secured to and extending between the rails;

a mounting shaft disposed transversely beneath said slotted plate;

a plurality of complementary barrier blade and lever members secured to individually rotatable sleeves carried along said mounting shaft, said barrier blades being normally retracted into the slots of the plate respectively, and said levers being normally extended from the slots of the plates and rotatively depressible in both the one-way and wrong-way direction;

spring means yieldingly urging the blade and lever members to said normal blade retraction and lever extention positions respectively;

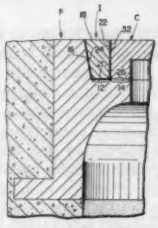
and coupling means responsive to wrong-way rotation of the levers to rotate the barrier blades therewith and upward from the slotted mounting plate, when encountering a wrong-way vehicle tire to damage the same.

4,158,515

METHOD AND APPARATUS FOR ELEVATING LOAD-BEARING ACCESS DEVICES

William R. Helms, 620 E. Holly, Goldsboro, N.C. 27530

Continuation of Ser. No. 819,923, Jul. 28, 1977, abandoned. This application Mar. 2, 1978, Ser. No. 882,548
Int. Cl.² E02D *29/14*
U.S. Cl. 404—72 **8 Claims**



6. A method for initially supporting a load-bearing access device in a supporting means so that the top of the access device is substantially level with the surrounding road surface

and subsequently, when the level of the road surface is to be raised, providing a modified supporting means so that when the access device is remounted therein the top of the access device will be substantially level with the raised road surface, which method comprises the steps of

(a) arranging a supporting means in a fixed position in the roadway, said supporting means comprising in combination

(1) A generally ring-shaped frame member that includes:

(A) an upper rim surface that is placed so that it is approximately level with the level of the roadway,

(B) an annular shoulder support surface located inwardly and below said upper rim surface and disposed generally parallel thereto, said shoulder support surface consisting of an outer seating surface and an inner seating surface, and

(C) an inner generally vertical side wall interconnecting said upper rim surface and said shoulder support surface, and

(2) a generally ring-shaped insert member comprising an upper surface, a lower bearing surface, and two side walls interconnecting said upper and lower surfaces, said lower bearing surface of said insert member resting upon said outer seating surface of the said shoulder support surface of said ring-shaped frame member,

(b) placing a load-bearing access device in said supporting means so that the lower circumferential rim of said access device rests on said inner seating surface of said annular shoulder surface of said ring-shaped frame member,

(c) removing said access device and said ring-shaped insert member when the level of the roadway is to be raised,

(d) disposing an extension member on and within said ring-shaped frame member to thereby produce a modified supporting means, said extension member

(1) having on its lower side a bearing surface that rest upon and is supported by at least said outer seating surface of said shoulder support surface, and

(2) having on its upper side a load support surface that approximately corresponds to the area of the inner seating surface of said shoulder support surface and is parallel thereto.

(e) replacing said access device in said modified supporting means so that the lower circumferential rim of said access device bears against the said upper side of said extension member.

4,158,516

PLATFORMS RESTING ON AN UNDERWATER STRUCTURE

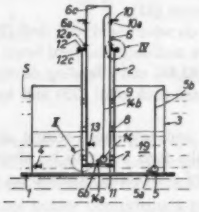
Alain G. N. Noblanc, and Claude P. Valenchon, both of Paris, France, assignors to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris", Paris, France

Filed Feb. 27, 1978, Ser. No. 881,692

Claims priority, application France, Mar. 3, 1977, 77 06206; Apr. 5, 1977, 77 10232

Int. Cl.[2] E02B *17/00*; E02D *27/52*

U.S. Cl. 405—196 **21 Claims**



1. A platform for supporting industrial or scientific installations at the surface of a body of water, comprising:

(a) a base structure designed to rest on the bottom of the sea or of a body of water;

(b) a hollow elongate element having a water-tight peripheral wall and water-tight lower end wall;

(c) locking means for temporarily fixing said hollow elongate element to the structure;

(d) supporting means for a part of a deck or a component of said installation,

(e) said base structure including a floatable device capable of keeping it afloat, means enabling the structure to be ballasted so as to install the base structure on the bottom of the sea or of the body of water; and at least one guide device in which the hollow element can slide vertically;

(f) a float capable of supporting at least part of said supporting means above the water;

(g) means enabling said hollow element to be immersed over at least the greater part of its height whereby the buoyancy of said hollow element may be adjusted,

(h) said supporting means being separate from said hollow element and including means enabling said supporting means to float on the water until they are over the top of said hollow element, and

(i) means enabling said supporting means to be fixed to said hollow element.

4,158,517

OSCILLATING STRUCTURE FOR EXPLORATION AT SEA

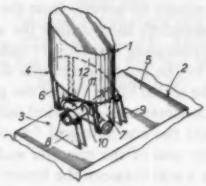
Vincent F. P. Foglia, Aulnay-sous-Bois, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines, Paris, France

Filed Mar. 29, 1978, Ser. No. 891,325

Claims priority, application France, Apr. 8, 1977, 77 10791

Int. Cl.[2] E02B *17/00*

U.S. Cl. 405—202 **3 Claims**



1. An oscillating structure for exploration at sea, said structure being installed on site and comprising:

a base resting on the sea bottom,

a column resting on the base and supporting a platform above sea level,

an articulated joint connecting the column to the base and allowing the column to oscillate in all directions under action of swell,

said column being ballasted in such a manner that the total weight of the ballast and the column/base assembly is greater than the maximum upward force which would be exerted on the column in order to maintain the articulated joint under permanent compression,

said articulated joint having two base plates fixed respectively at the bottom of the column and at the upper surface of the base,

two fixed supports mounted on each of the base plates and parallel one to the other,

bearings, formed of two half collars which can be dismantled, fixed to the end of said fixed supports, the axes of the bearings being in alignment,

a cross-shaped member formed by two perpendicular branches located in different planes, and

extensions of the cross-shaped member oscillating in said bearings.

4,158,518

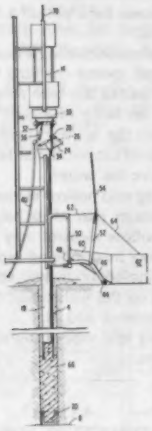
IN SITU PILE FORMING METHOD

Fredric Rusche, 30303 Beck Rd., Wixom, Mich. 48096

Filed Sep. 13, 1977, Ser. No. 832,947

Int. Cl.[2] E02D *5/42*

U.S. Cl. 405—240 **4 Claims**



1. The method of forming in situ a casingless pile which comprises:

pre-drilling into the ground a hole,

inserting into the pre-drilled hole a hollow mandrel having an open top and closure means associated therewith, at least partly filling the mandrel with low slump concrete from the (bottom) bottum up by dumping the concrete from a hopper through the open top thereof, so that the concrete falls entirely by gravity from the hopper into the bottom of the mandrel, then sealing the upper portion of the mandrel by operating said closure means so as to close said open top to the atmosphere then forcing air under pressure into the sealed upper end of the mandrel until the weight of the concrete in the mandrel and the pressure of the air compacts the concrete and forces some of it between the lower end of the mandrel and the side of the hole and forms a seal between the lower end of the mandrel and the side of the hole, and hoisting the mandrel upwardly from the hole.

4,158,519

ROCK REINFORCEMENT

Douglas W. Gamlin, Ayr, Scotland, assignor to Imperial Chemical Industries Limited, London, England

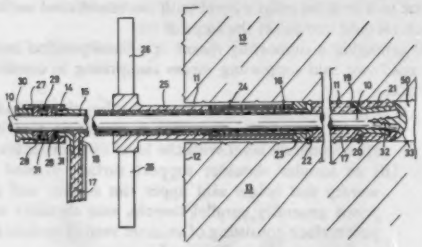
Filed Jul. 21, 1977, Ser. No. 817,675

Claims priority, application United Kingdom, Aug. 6, 1976, 32842/76

Int. Cl.[2] E21D *21/00*

U.S. Cl. 405—260 **11 Claims**

1. A method of rock reinforcement comprising drilling a hole into a rock mass, attaching an end of a rope to a piston which has a resilient circumferential portion in slidable sealing engagement with the drillhole wall, inserting the piston into the drillhole and injecting a fluent, hardenable grouting material against the outer end of the piston and into a space between the rope surface and the drillhole wall to drive the piston toward the blind end of the drillhole, to draw the rope into the drillhole and to surround the rope with the grouting material whereby, when the grouting material hardens, the rope is



bonded to the drillhole wall and the rock mass is consequently reinforced.

4,158,520

ROCK BOLTING APPARATUS

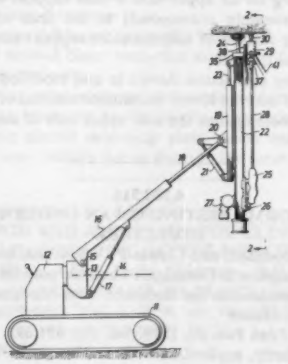
Soren P. Prebensen, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Feb. 28, 1978, Ser. No. 882,236

Claims priority, application Sweden, Mar. 3, 1977, 7702348

Int. Cl.[2] E21D *11/00*

U.S. Cl. 405—260 **19 Claims**



1. Rock bolting apparatus comprising:

a rock drill (25);

a bolt setting device (31);

a feed beam (22) on which said rock drill (25) and bolt setting device (31) are mounted, the feed beam having elongated guide means (43,44) and a feeding device (27,49) which is common to said rock drill (25) and to said bolt setting device (31);

said rock drill and said bolt setting device both being mounted on the feed beam to be alternatively movable into and out of a working position on said guide means; and

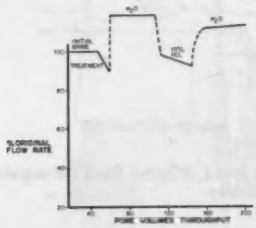
power means (55,56,62,63) for alternately moving said rock drill and said bolt setting device into and out of a working position on said guide means.

4,158,521

METHOD OF STABILIZING CLAY FORMATIONS

Robert W. Anderson, Fort Worth, and Bob G. Kannenberg, Arlington, both of Tex., assignors to The Western Company of North America, Fort Worth, Tex.

Filed Jun. 26, 1978, Ser. No. 919,215
Int. Cl.[2] E02D 3/14; E21B 33/13
U.S. Cl. 405—264 16 Claims



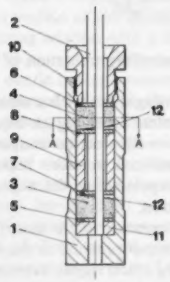
1. A method for stabilizing an earth formation which comprises fine particulate materials selected from the group consisting of clay, mineral particles less than about 7 microns, and mixtures thereof, comprising contacting said formation with an effective amount of copolymer of epichlorohydrin and dimethylamine.

4,158,522

METHODS AND APPARATUS FOR DETACHABLY FASTENING A TOOL SHAFT TO A TOOL HOLDER

Sven A. O. Wirfelt, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed Nov. 14, 1977, Ser. No. 851,350
Claims priority, application Sweden, Nov. 11, 1976, 7612628
Int. Cl.[2] B23B 35/00, 51/00, 31/00
U.S. Cl. 408—1 BD 9 Claims



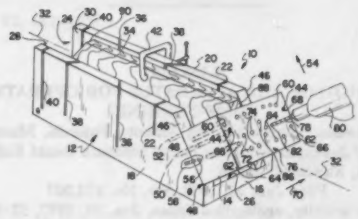
1. Apparatus comprising a tool holder, a tool shaft, means carried by said tool holder for transmitting torsional movement to said tool shaft, and means for detachably fastening said tool shaft to said tool holder comprising a plurality of gaskets surrounding said tool shaft, and press rings for compressing said gaskets, said gaskets being nonsymmetrical relative to a longitudinal axis of said tool shaft.

4,158,523

MITER BOX AND FRAME DOWELING DRILL JIG APPARATUS

Jerry J. Schotzko, R.R. #1, Box 112, Rolling Stone, Minn. 55969

Filed Mar. 13, 1978, Ser. No. 885,530
Int. Cl.[2] B23B 47/28; B26D 1/54; B25B 29/00, 1/00
U.S. Cl. 408—115 R 9 Claims



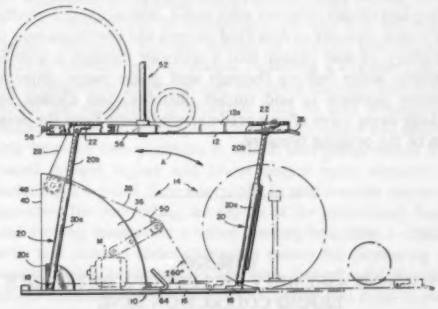
1. A miter box and frame doweling drill jig apparatus comprising a miter box having a base portion and a pair of side wall portions, said side wall portions being secured to said base portion and upstanding from an uppermost lateral surface of said base portion, each of said side walls being located in spaced apart parallel relationship having opposed interior surfaces, the end of each of said side walls being located adjacent one another being chamfered defining parallel chamfered edges, a plate, means to removeably secure said plate to said chamfered edges at selected locations therealong, said plate having a plurality of holes therein whereby each of said plurality of holes extend transverse to said chamfered edges when said plate is secured to said chamfered edges.

4,158,524

MOBILE CHAIR LIFT

Joseph W. Serafin, 222 Flat Hills Rd., Amherst, Mass. 01002

Filed Feb. 23, 1978, Ser. No. 880,628
Int. Cl.[2] B60P 1/48
U.S. Cl. 414—678 8 Claims



2. A chair lift comprising a rigid base frame, longitudinally-extendible legs, one at each of the four corners of the base frame, means pivotally connecting the lower ends of the legs to the four corners of the base frame, a platform, means pivotally connecting the upper ends of the legs to the four corners of the platform, said platform being movable by pivotal movement of the legs from a position at the level of the base frame to an elevated position above and parallel to the base frame, a capstan on the base frame, cable means connected at one end to the capstan for winding on and unwinding from the capstan and at the other end to the platform, a first idler roll supported above the capstan over which the cable means is entrained, means for

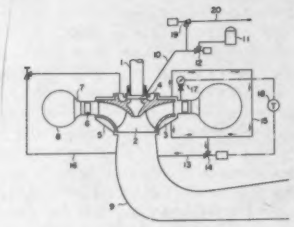
effecting rotation of the capstan and a second idler roll arranged forwardly of the first idler roll on an axis parallel thereto and at a lower level in a position to intercept the cable means as the platform moves toward the level of the base to dispose the cable means running from the second idler roll to the platform at a steeper angle than that running from the second idler roll to the first idler roll.

4,158,525

METHOD OF AND APPARATUS FOR OPERATING PUMP TURBINE

Yozo Kawase, Yokohama, and Makoto Fujisaki, Musashino, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 24, 1978, Ser. No. 872,007
Claims priority, application Japan, Jan. 31, 1977, 52/9349
Int. Cl.[2] F01D *1/06*
U.S. Cl. 415—1 **2 Claims**



1. A method of operating a pump turbine comprising the steps of supplying compressed air into a runner chamber of said pump turbine and opening a leakage drain valve of a guide vane at the time of starting said pump turbine to force downwardly the level of the water in said runner chamber and to rotate a runner of said pump turbine in air, exhausting the compressed air in said runner chamber when the rotating speed of said runner reaches a rated speed for pump operation, thus filling said runner chamber with water, draining water containing a large quantity of dissolved oxygen and contained near the periphery of said runner into a spillway through a pipe for draining water leaking through said guide vanes, detecting priming pressure in said runner chamber, and closing said leakage drain valve after a predetermined time from the detection of the priming pressure.

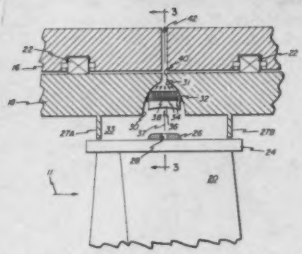
4,158,526

TURBINE ASSEMBLY INCLUDING A ROTATABLE LIQUID COLLECTION RING

Bruce W. Gerhold, Rexford, and Herman M. Leibowitz, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 9, 1978, Ser. No. 867,952
Int. Cl.[2] F02C *7/12*; F01D *5/18*
U.S. Cl. 415—115 **15 Claims**

1. A turbine machine comprising:
(a) a stationary casing having a radially inner surface,
(b) a rotor assembly mounted for rotation within and relative to said casing and having a plurality of outlets adapted to discharge high-velocity jets comprising liquid coolant toward said radially inner surface,
(c) an annular ring disposed intermediate said casing and said rotor assembly, said ring being mounted for rotation substantially about the axis of rotation of said rotor assembly



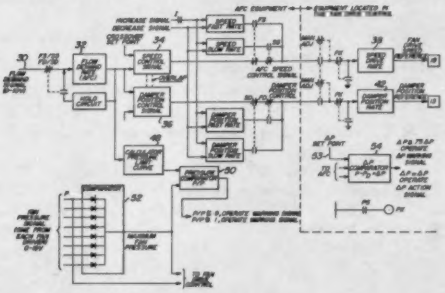
at an angular speed different from the angular speed of said rotor assembly.

4,158,527

ADJUSTABLE SPEED DRIVE SYSTEM FOR CENTRIFUGAL FAN

Jerry D. Burkett, Hopewell Junction, N.Y., assignor to Eco-Laire Incorporated, Malvern, Pa.

Division of Ser. No. 718,303, Aug. 26, 1976. This application Oct. 22, 1976, Ser. No. 725,901
Int. Cl.[2] F04B *49/06*; F01D *4/00*
U.S. Cl. 417—18 **7 Claims**



1. A method of controlling operation of a centrifugal fan comprising:
(a) providing a centrifugal fan with a means whereby upset conditions in a system receiving air from said fan can be monitored and correction action initiated,
(b) providing an artificial pressure limitcurve above the operation curve representing the expected spectrum of normal fan operation,
(c) monitoring the operation of the centrifugal fan by measuring its actual output pressure at the then existing flow rate and generating a first signal, determining the existing flow rate and the desired pressure for the fan at the existing flow rate, generating a second signal representing said desired pressure,
(d) comparing said first and second signals,
(e) generating a third signal when as a result of said comparison the actual fan pressure signal exceeds the desired pressure signal at the then existing flow rate by a predetermined amount and is at least equal to a point on said limit curve.

4,158,528

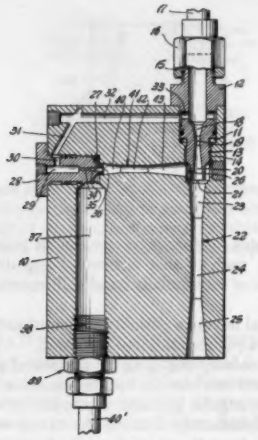
GAS-OPERATED VACUUM TRANSDUCER

Clifford S. Lasto, Orange, and Raymond A. DuHaime, Huntington, both of Conn., assignors to Air-Vac Engineering Co., Inc., Milford, Conn.

Continuation-in-part of Ser. No. 396,597, Sep. 12, 1973, abandoned. This application Feb. 26, 1975, Ser. No. 553,321

Int. Cl.[2] F04F 5/22

U.S. Cl. 417—163 3 Claims



1. An air-operated vacuum transducer which provides a relatively high ratio of vacuum flow to gas flow of at least 0.25 to 1 for creating a vacuum of from at least 1" Hg absolute down to less than 0.25" Hg absolute in a conduit having a gas exit cavity, said transducer comprising a first venturi and a smaller second venturi, said first venturi having a larger jet nozzle and a restricted throat section of greater length and diameter than said second venturi whereby said first venturi has an air-flow consumption which is from 5 to 15 times greater than the air-flow consumption of said second venturi, each said venturi comprising a jet nozzle and a venturi tube comprising a converging gas entrance section, a restricted throat section and a diverging gas exit section, the entrance section of the second venturi tube being in communication with the outlet of the conduit from which gas is to be drawn as vacuum flow to create a negative gauge pressure in said conduit, the gas exit section of the second venturi tube being in close gas-conducting relation with a chamber connected with the gas entrance section of the first venturi tube, the first venturi having a jet nozzle having a converging entrance passage, a restricted passage and a diverging exit passage opening into said converging passage of said first venturi tube for directing a jet of air under pressure through said first venturi tube at a determinate velocity sufficient to create a negative gauge gas pressure in said chamber and in the second venturi tube, and the second venturi having a jet nozzle having a restricted passage and a diverging exit passage which opens into the converging passage of said second venturi tube for directing a jet of air under pressure through said second venturi tube at a determinate velocity sufficient to increase the negative gauge air pressure to a value of from at least 1" Hg absolute down to less than 0.25" Hg absolute in said chamber, in said second venturi tube and at the outlet of said conduit, and an air conduit connecting the intake side of said first jet nozzle to the intake side of said second jet nozzle whereby air under pressure of from 60 psi to 120 psi supplied to said first jet nozzle as air flow is simultaneously supplied at the same pressure to said second jet nozzle by means of said gas conduit.

4,158,529

CONTROL DEVICE FOR A PUMPING ARRANGEMENT

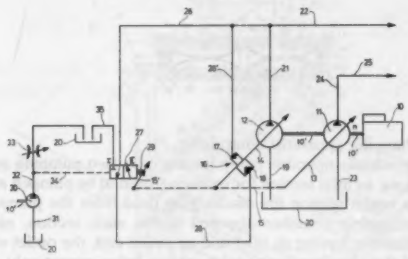
Gerhard Nonnemacher, Korntal; Emil Knodel, Stuttgart, and Paul Bosch, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 11, 1976, Ser. No. 657,082

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1975, 2505780

Int. Cl.[2] F04B 49/00

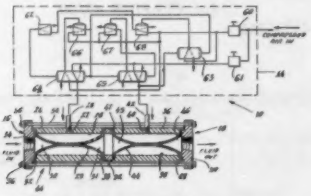
U.S. Cl. 417—216 24 Claims



1. In an arrangement for pumping fluids, a combination comprising pump means for pumping a fluid at a variable output rate, including at least one variable-output pump having an adjusting element movable between a high-output position and a low-output position through a plurality of intermediate positions; drive means for driving said pump means at different speeds; first generating means for generating a first signal proportionate only to the instantaneous speed of said drive means, including an auxiliary pump driven by said drive means and operative for discharging control fluid at a discharge rate proportionate only to the speed of said drive means, a discharge conduit communicating with said auxiliary pump, and a throttle valve in said discharge conduit; second generating means for generating a second signal indicative only of the instantaneous output rate of said pump, including said adjusting element; and adjusting means for adjusting the output rate of said pump means in dependence on said first and second signals, including moving means for moving said actuating element between said positions, including a cylinder-and-piston arrangement acting on said adjusting element, and conduit means for supplying pressurized fluid to said arrangement; control means for controlling said moving means and displaceable between two positions in which said pump means is adjusted toward higher and lower output rates, respectively, including a control slide interposed in said conduit means and operative for controlling the supply of the pressurized fluid to said moving means and a valve housing bounding a chamber with said control slide; displacing means for displacing said control means between said positions thereof, said displacing means including first biasing means urging said control means toward one of said positions with a first force proportionate to said first signal, including a connecting conduit communicating said discharge conduit with said chamber so that said control fluid discharged by said auxiliary pump acts on said control slide, and second biasing means urging said control means toward the other position with a second force, and including a spring acting on said control slide against the action of said control fluid in said chamber, and varying means for varying one of said forces in dependence only on said second signal, including a motion-transmitting element connected to said adjusting element for movement therewith and operative for varying the tension of said spring to thereby vary said second force.

4,158,530
PUMPING APPARATUS COMPRISING TWO COLLAPSIBLE CHAMBERS

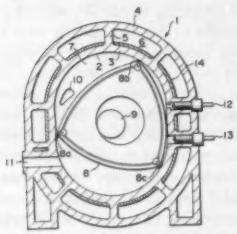
Robert E. Bernstein, 8 Merriam Rd., Framingham, Mass. 01701
Continuation of Ser. No. 484,940, Jul. 1, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 673,837
Int. Cl.[2] F04B *43/10, 45/06*
U.S. Cl. 417—389 14 Claims



1. Pumping apparatus comprising:
a valvelessly operable pump having only two pumping sections, an inlet section for receiving fluid to be pumped and an outlet section for discharging fluid from the pump, a collapsible chamber disposed within each section, each chamber having an inlet and an outlet end, the outlet end of the chamber in the inlet section being operatively directly connected in series to the inlet end of the chamber in the outlet section so that fluid in the chamber in the inlet section discharges into the chamber in the outlet section, and a pump drive mechanism coupled to the pump for sequentially opening and closing the pump chambers in a manner so as to produce pumping action.

4,158,531
ROTARY ENGINE WITH AN OSCILLATION DAMPING LAYER

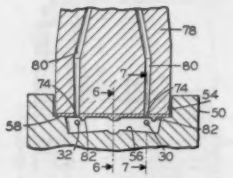
Ryozo Ito, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed Mar. 29, 1977, Ser. No. 782,312
Claims priority, application Japan, Jul. 2, 1976, 51-79332
Int. Cl.[2] F01C *21/06;* F02F *1/10*
U.S. Cl. 418—83 2 Claims



1. A rotary engine comprising a casing composed of a rotor housing having a trochoidal inner peripheral surface and side housings which close the opposite ends of said rotor housing, an eccentric shaft and a polygonal rotor adapted to eccentrically rotate around said eccentric shaft with apex portions sliding over said trochoidal inner peripheral surface, said rotor housing including an inner wall portion which provides said trochoidal inner peripheral surface and an outer wall portion which encloses said inner wall portion therein while a cooling water passage is defined therebetween, wherein the improvement comprises an oscillation damping layer means made of fluorinated rubber provided on at least a part of the surface of said inner wall portion which faces said cooling water passage, said layer means having a substantially greater thickness than a mere surface coating layer so as to have a substantial kinetic energy absorbing capacity.

4,158,532
APPARATUS OF MANUFACTURING FASTENING ELEMENT TRAIN

John A. Kowalski, Erie, Pa., assignor to Textron Inc., Providence, R.I.
Division of Ser. No. 748,343, Dec. 7, 1976, Pat. No. 4,096,225, which is a division of Ser. No. 583,700, Jun. 4, 1975. This application Apr. 3, 1978, Ser. No. 892,548
Int. Cl.[2] B29D *5/00;* B29F *1/00;* B29C *1/14*
U.S. Cl. 425—121 6 Claims



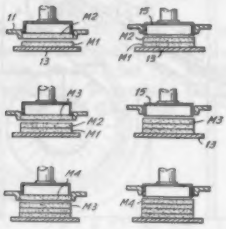
1. An apparatus for forming a continuous train of slide fastener elements, each of said elements being disposed transversely of a pair of substantially parallel filaments, said apparatus comprising
a cavity wheel having a plurality of spaced molding cavities formed in a peripheral portion thereof,
a band continuously engaging the peripheral portion of the cavity wheel to close the molding cavities between first and second angular positions of the cavity wheel,
means for continuously rotating the cavity wheel and for moving the band therewith from the first angular position to the second angular position,
said band being disengaged from the peripheral portion prior to the first angular position and after the second angular position,
said cavity wheel having grooves formed in the peripheral portion between the molding cavities and aligned along a pair of annular axes,
means for guiding a pair of continuous filaments into the grooves prior to the first angular position,
said band having gate openings formed therein for communicating with the molding cavities,
means for injecting thermoplastic through the gate openings into the molding cavities between the first and second angular positions,
means for removing the pair of filaments and molded fastener elements from the cavity wheel after the second angular position,
said gate openings in the band overlying portions of the molding cavities forming leg portions of the fastening elements, and
said band including projections extending into portions of the cavities forming opposite leg portions of the fastening element such as to form openings in the leg portions of the fastening elements mating with gate stubs formed in the gate openings.

4,158,533
APPARATUS FOR PRODUCING AND STRIPPING PRESSED CEMENT TILES WITH SUPERIMPOSITION OF A PLURALITY OF STRIPPED TILES

Enrico Longinotti, Florence, Italy, assignor to Longinotti S.p.A., Italy
Continuation-in-part of Ser. No. 694,548, Jun. 10, 1976. This application Jan. 18, 1978, Ser. No. 870,521
Claims priority, application Italy, Jun. 27, 1975, 9472 A/75; Jan. 20, 1977, 9317 A/77
Int. Cl.[2] B28B *13/04*
U.S. Cl. 425—139 7 Claims

1. In apparatus for the production of pressed tiles including molds for forming and pressing the tiles, stripping means oper-

able to strip pressed tiles from the molds, respective plates operable to receive and support each stripped tile, and treatment means operable to subsequently treat the tiles supported on the plates, the improvement comprising, in combination, means operable to superimpose plural stripped tiles in at least



one pile on each plate solely by moving successively stripped tiles downwardly perpendicular to said plate without horizontal displacement of the tiles; and means operable to move each plate, with at least one pile of stripped tiles supported thereon, to said treatment means.

4,158,534

APPARATUS FOR CUTTING OPENINGS AT ARBITRARILY SELECTABLE INTERVALS INTO PIPES

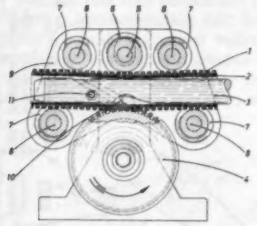
Wilhelm Hegler, Goethe Str. 2, 873 Bad Kissingen, Fed. Rep. of Germany, and Ralph P. Hegler, Bad Kissingen, Fed. Rep. of Germany, assignors to Wilhelm Hegler, Bad Kissingen, Fed. Rep. of Germany

Filed Jan. 21, 1977, Ser. No. 761,174

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1976, 2630078

Int. Cl.² B29C *17/14*

U.S. Cl. 425—142 **16 Claims**



1. An apparatus for cutting openings at aribtrarily selectable intervals into a pipe which has an inside and outside surface comprising a knife and a movable element whose movement is responsive to a signal to move the knife and pipe wall into mutual contact and against a backup means so that the knife cuts into the pipe wall.

4,158,535

GENERATION OF POLYURETHANE FOAM

Gerald V. Dever, Jr., Trumbull, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jan. 25, 1977, Ser. No. 762,555

Int. Cl.² B29D *27/00*

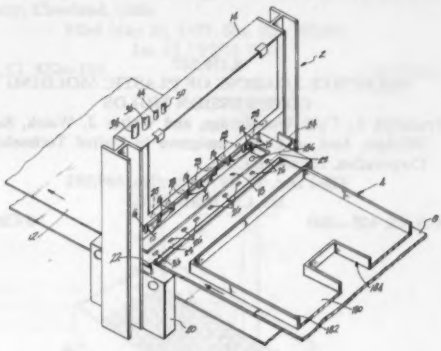
U.S. Cl. 425—145 **8 Claims**

1. An apparatus for generating foam from a mixture of foam-forming materials in a structure having a preformed configuration, said apparatus comprising:

(a) conveyor means for conveying such a structure along a horizontal path;

(b) a plurality of foam gun heads mounted in spaced relationship to each other over and transversely to said path, each said foam gun head including a foam dispensing outlet and closed valve means for controlling the discharge of the foam-forming materials therefrom;

(c) control means, operatively associated with each of said gun heads, for sensing the passage of a random series of structures of various widths, lengths and shapes under the outlet of an individual gun head and opening the closed valve means of said individual foam gun head when said control means senses that at least a portion of such a structure is passing under the outlet of said individual



foam gun head and maintaining said opened valve means open during such time as at least a portion of such a structure is passing under said outlet and for closing said opened valve means of an individual foam gun head when said control means senses that no portion of such a structure is under said outlet and maintaining said closed valve means closed during such period of time as no portion of such a structure is under the outlet of said opened valve means, whereby structures of various widths, lengths and shapes can be automatically filled with foam.

4,158,536

APPARATUS FOR THE AUTOMATIC PREPARATION AND MOLDING OF SAMPLES FOR X-RAY ANALYSIS

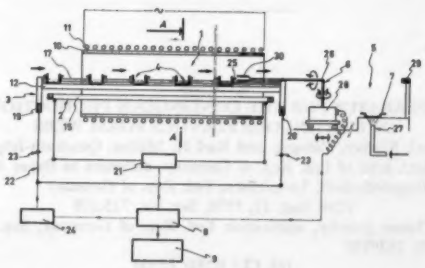
Gerard Willay, Rte. d'Ars, Ars sur Moselle, France, and André Wittmann, 4, place du Général de Gaulle, Metz, both of France

Filed Dec. 9, 1977, Ser. No. 859,150

Claims priority, application France, Dec. 15, 1976, 76 37853

Int. Cl.² B29F *5/00*; B29C *11/00*

U.S. Cl. 425—169 **8 Claims**



1. Apparatus for the automatic preparation of samples for analysis comprising a fusion furnace, a casting device and means for the automatic control of the unfolding of the manufacturing sequence, characterized in that the fusion furnace is constituted by a heating enclosure of tubular form, horizontally disposed and opened, at its two ends to permit, respec-

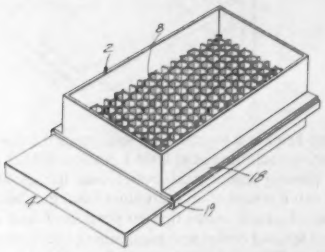
tively, the introduction and the removal of crucibles with samples in regular alignment and in that the said apparatus is equipped with means of "step by step" transport assuring a periodical progression of the crucibles in the interior of the heating enclosure in successive and repeating stages, and means for agitating the samples during momentary stops of the crucibles in their periodic progression.

4,158,537

SELECTIVE LOADING OF PLASTIC MOLDING COMPRESSION MOLDS

Frederick L. Cuff, Woodbridge, and Walter J. Walek, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 12, 1977, Ser. No. 859,882
Int. Cl.[2] B28B *13/02*
U.S. Cl. 425—260 **6 Claims**



1. A shuttle for loading a mold cavity in a mold in readiness for molding the material loaded therein, the shuttle including:

a box having an open area corresponding in shape to the mold cavity and a flange on the lower edge to engage in the cavity and locate the box thereon;

a slidable bottom on said box adapted, when removed, to uncover the open area of the box; and

a grid in said box directly above the slidable bottom and immersed at least in part in the material in a position to hold the molding material in position laterally when the bottom is removed, said grid engaging the side walls of the box to position it thereon.

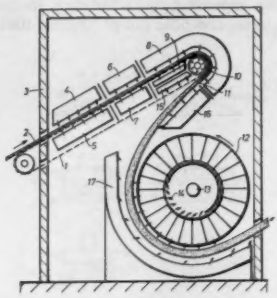
4,158,538

APPARATUS FOR THE CONTINUOUS PRODUCTION OF CONTINUOUS PLASTICS FOAM WEBS

Frank Kleiner, Cologne, and Karl H. Müller, Quadrath-Ichendorf, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 17, 1976, Ser. No. 715,078
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1975, 2539701
Int. Cl.[2] B29D *27/00*
U.S. Cl. 425—445 **8 Claims**

1. An apparatus for the continuous production of continuous plastic foam webs comprising: a conveyor belt inclined at an angle from 0° to 50° to the horizontal for conveying a polyolefin web preheated to below the crystallite melting point; heating means disposed above and below the surface of the belt in a plurality of zones for heating the web to cross-link same; and means downstream of the conveyor belt for blowing hot air towards the web after it is released from the conveyor belt to



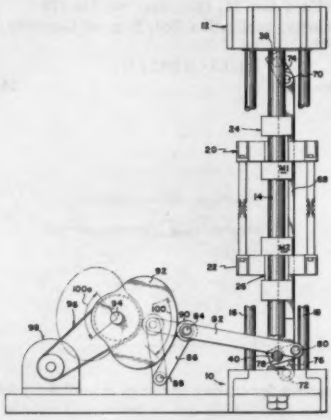
both guide the web in a freely suspended state in space in an arcuate path and apply heat to the web to induce foaming.

4,158,539

THERMOFORMING MACHINE WITH VARIABLE MOLD CLOSED CYCLE

Albert W. Arends, Gladwin; George L. Pickard, Beaverton; G. Allan West, Clare, and Edward J. Russell, Gladwin, all of Mich., assignors to Leesona Corporation, Beaverton, Mich.

Filed May 10, 1978, Ser. No. 904,587
Int. Cl.[2] B29C *17/00*; B30B *1/26*
U.S. Cl. 425—451.4 **12 Claims**



1. In a thermoforming machine having a frame, a pair of mold carrying platens mounted on said frame for movement toward and away from each other between a mold open and a mold closed position, and motor driven means including cam and cam follower means operable when driven to cyclically drive said platens between said mold open and mold closed position, the improvement wherein said motor driven cam and cam follower means comprises a cam mounted on said frame for rotation about a first axis and having a dwell portion of given angular extent lying at a constant radius from said axis, said follower means including a cam follower engaged with said cam and operable to maintain said mold platens in said mold closed position when said cam follower is engaged with said dwell portion of said cam, variable speed motor means for driving said cam in rotation about said axis, and control means for selectively controlling the speed of said motor means during that portion of the rotary cycle of said cam when said cam follower is engaged with said dwell portion to thereby adjust-

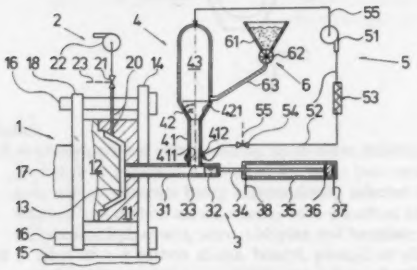
ably vary the time during which said mold platens are held in said mold closed position.

4,158,540

PROCESS AND APPARATUS FOR MANUFACTURING MOLDED PARTS FROM GRANULATED PLASTIC MATERIALS

Bruno Stillhard, St. Gall, and Hans Näf, Wil, both of Switzerland, assignors to Gebruder Buhler AG, Switzerland

Filed Jun. 24, 1977, Ser. No. 809,680
Claims priority, application Switzerland, Jul. 2, 1976, 8482/76
Int. Cl.² B29F *1/06*
U.S. Cl. 425—550 **15 Claims**



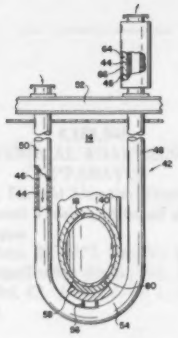
1. A device for the impact sintering of granulated material into molded parts, comprising a mold having first and second relatively movable parts which define a mold cavity therebetween, a feed conduit connected into said mold cavity, a vertically elongated plasticizing vestibule having a closed top end and a bottom opening into said conduit through which plasticizable material is fed to said conduit, said vestibule having an interior including a lower substantially cylindrical first zone portion, an upper substantially cylindrical third zone portion of a bigger diameter than said first zone portion and an intermediate second zone portion interconnecting said first and third zone portions, means for feeding granular material into said vestibule, a ram displaceable in said feed conduit and through one of said mold parts to the boundary of the cavity for advancing material in said conduit into said cavity, and means for circulating a hot gas at plasticizing temperature to the lower end of said vestibule and upwardly therethrough to plasticize the grains into a thin layer and to make the layer weldable.

4,158,541

APPARATUS FOR CALCINING GREEN COKE

Ernest W. Klechka, Strongsville, and James R. Hemsath, Fairview Park, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 16, 1977, Ser. No. 797,086
Int. Cl.² F27B *7/38*
U.S. Cl. 432—116 **6 Claims**



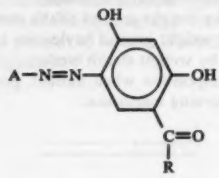
1. In an apparatus for calcining green coke to produce calcined coke, said apparatus comprising a kiln for heating said green coke and incinerating the off-gas produced by said heating, dust removal means for removing particulate matter from incinerated off-gas produced in said kiln, a feed pipe passing through at least a portion of the body of said dust settling chamber for feeding green coke into one end of said kiln, and support means for supporting said feed pipe in said dust settling chamber, the improvement wherein said support means comprises a hollow pipe and motive means for moving a gas through the bore of said pipe.

4,158,542
ACYLDIHYDROXYBENZENE AZO DYES FOR METALLIZED POLYOLEFINS

Raouf Botros, Beech Creek, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

Division of Ser. No. 692,910, Jun. 4, 1976, abandoned. This application Mar. 22, 1978, Ser. No. 888,876
Int. Cl.² C09B *45/00*; D06P *1/10*
U.S. Cl. 8—42 D **12 Claims**

1. Metallized polyolefin dyed with an acyldihydroxybenzene azo compound of the formula:



wherein

A is phenyl, phenyl substituted by up to three substituents, naphthyl or naphthyl substituted by up to two substituents, the substituents being independently selected from alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, trifluoromethyl, cyano, nitro, chlorine and bromine; and

R is alkyl of 1–4 carbon atoms, benzyl, phenyl, or phenyl substituted by up to two substituents independently selected from alkyl 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, chlorine and bromine.

4,158,543
CLEANER FOR GRAIN AND SUEDE LEATHER

Jan A. Orlowski, 1304 Rubio Dr., Altadena, Calif. 91001

Filed Feb. 3, 1978, Ser. No. 874,766
Int. Cl.² C14C *11/00*; B08B *3/00*
U.S. Cl. 8—137 **20 Claims**

1. A pliable, relatively soft, solid and cohesive article for cleaning a spotted or soiled surface of grain leather or suede leather, and that is formed from a uniform mixture of from about 20% to about 60% by weight of the article of a rubber-type material formed from a homopolymer or copolymer of a monomer selected from the group consisting of monomers having at least four carbon atoms and two conjugated double bonds, and isobutylene, from 10% to 50% by weight of the article of a liquid plasticizer/solvent for the rubber-type material, said plasticizer/solvent having a boiling point at atmospheric pressure no lower than about 120° C., and rendering the article soft and flexible for use, and from 10% to no more than 50% by weight of the article of finely divided inorganic particulate filler, said mixture being compounded so that the article is yielding on contact with the surface to be cleaned to avoid damage to the surface while permitting frictional engagement of the article therewith.

4,158,544
PROCESS FOR PREPARING A BIOLOGICAL COMPOSITION FOR USE AS A REFERENCE CONTROL IN DIAGNOSTIC ANALYSIS

Allan L. Louderback, Temple City, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 17, 1978, Ser. No. 925,483
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **10 Claims**

1. A process for making a biological composition for use as a blood serum reference composition in diagnostic analysis comprising:

(a) adding calcium to citrated plasma and mixing well to form decitrated plasma;

(b) adding thrombin to said decitrated plasma and mixing well to form a clot of fibrin;

(c) performing at least one freeze-thaw routine on said clot to cause the fibrin to contract;

(d) removing the fibrin to thereby obtain serum;

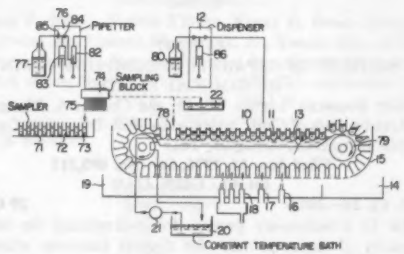
(e) molecular washing and ultrafiltering the serum and thereby obtaining concentrated serum; and

(f) adding to the concentrated serum at least one alkylene polyol having from 2–5 carbon atoms in an amount such that said composition's non-biological component comprises from about 60 to about 80 weight percent water and from about 20 to about 40 weight percent of said alkylene polyol.

4,158,545
AUTOMATIC CHEMICAL ANALYZING METHOD AND APPARATUS

Katsuji Yamashita; Hiroshi Umetsu; Kazuyoshi Heguri, all of Katsuta, and Kasumi Yoshida, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 20, 1977, Ser. No. 834,902
Claims priority, application Japan, Sep. 22, 1976, 51-114226
Int. Cl.² G01N *1/14, 1/18*
U.S. Cl. 23—230 R **16 Claims**



1. An automatic chemical analyzing method comprising the steps of:

successively transporting samples one by one in groups to a sampling station, said samples being grouped into a plurality of sample groups, each sample group including a plurality of samples which are to be analyzed with respect to the same test items;

successively feeding these transported samples, with each sample divided into a number of portions corresponding to the number of test items for the sample group which includes the sample, with a reagent to a reaction line;

storing the test items for each sample group in a memory of a central control unit for controlling the operation of an analyzing system in accordance with each test item prior to the feeding of the first sample of each sample group to the reaction line;

discretely transporting through said reaction line the portions of the samples fed to said reaction line, respectively;

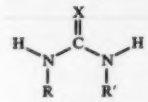
photometrically measuring the portions of the samples subjected to a reaction during the transportation through said reaction line; and reading the test items for the sample group to be next analyzed from said memory in the central control unit to control the operation of the analyzing system in accordance with these test items when the sample group fed to said reaction line is altered.

4,158,546
COMPOSITION, TEST DEVICE AND METHOD FOR DETERMINING THE PRESENCE OF UROBILINOGEN IN A TEST SAMPLE

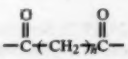
Charles T. W. Lam, and Chauncey O. Rupe, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jul. 24, 1978, Ser. No. 927,517
Int. Cl.[2] G01N *21/06, 33/16*
U.S. Cl. 23—230 B **20 Claims**

1. In a composition capable of producing a detectable response in the presence of urobilinogen in a test sample, which composition comprises p-di(lowr alkyl)aminobenzaldehyde as an indicator and a buffer substance capable of producing a pH of about 0.5 to 3, the improvement wherein said composition further comprises a compound having the structure



in which X is O or S; and in which R and R′, same or different, are lower alkyl, or in which R and R′ together are lower alkylene or



wherein n is an integer from 1 to about 6.

4,158,547
METHOD OF SEPARATING COMPONENTS IN A BIOLOGICAL FLUID

Robert Rousseau, Laguna Niguel, and Charles A. Manganaro, Arcadia, both of Calif., assignors to DCA-Diagnostic Corporation of America, Arlington, Tex.

Filed Jun. 11, 1976, Ser. No. 695,311
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230.6 **29 Claims**

16. In a radioassay process for determining the binding capacity of serum proteins for thyroid hormone wherein a known quantity of thyroid hormone labeled with a radioactive isotope is added to a serum sample to compete for binding sites on said serum proteins with the thyroid hormone in said sample, the improvement comprising admixing insolubilized serum albumin capable of forming a finely dispersed, precipitable suspension in said serum to adsorb unbound labeled and unlabeled thyroid hormone and separating said insolubilized albumin from said serum containing bound labeled and unlabeled thyroid hormone.

4,158,548
PROCESS FOR REMOVING SULFUR FROM COAL

Emmett H. Burk, Jr., Glenwood; Jin S. Yoo, South Holland, and John A. Karch, Chicago, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 726,082, Sep. 23, 1976, abandoned. This application Mar. 15, 1978, Ser. No. 886,976
Int. Cl.[2] C10L *9/10*; C10B *57/00*
U.S. Cl. 44—1 R **18 Claims**

1. A process for reducing the pyritic sulfur content of coal comprising:

(1) contacting coal particles with an aqueous solution of iron complexing agent, and an oxidant at elevated temperature; and

(2) recovering coal particles of reduced sulfur content.

4,158,549
MARIJUANA SCENTED INCENSE AND METHOD OF MAKING

Kenneth E. Martin, 30 Hollywood Dr., Florence, Ky. 41042

Filed Mar. 31, 1978, Ser. No. 892,098
Int. Cl.[2] C10L *5/44*
U.S. Cl. 44—1 R **10 Claims**

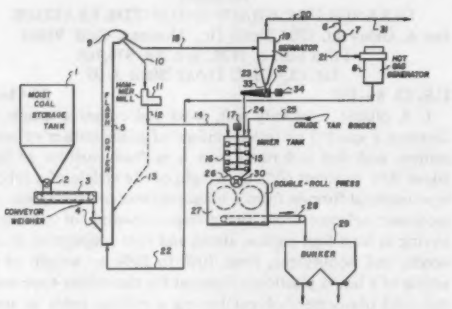
1. An incense composition comprising:
about 10 parts by weight ground alfalfa stems and leaves,
about 1 part by weight ground bayleaves; and
about 1.5 parts by weight starch binder.

6. An incense composition comprising:
about 10 parts by weight ground alfalfa stems and leaves,
about 1 part by weight ground bayleaves; and
about 1.5 parts by weight starch binder;
said incense composition when burned, producing a scent like that of burning marijuana.

4,158,550
APPARATUS FOR PRODUCING BLAST FURNACE COAL

Heinrich Weber, Recklinghausen; Horst Dungs, Herne; Klaus Urbye, Flaesheim; Franz Beckmann, Alsdorf; Hugo Schmauch, Merchweiler, and Karl H. Flasche, Bons, all of Fed. Rep. of Germany, assignors to Firma Carl Still, Fed. Rep. of Germany

Division of Ser. No. 832,365, Sep. 12, 1977. This application Mar. 6, 1978, Ser. No. 883,512
Int. Cl.[2] B30B *11/00*; C10L *5/02*
U.S. Cl. 44—13 **1 Claim**



1. An apparatus for producing blast furnace coal from bituminous coals, comprising a fine coal hopper, a flash drier, means for conveying coal from said hopper to the lower end of said flash drier, for delivering hot gas to the lower end of said drier upwardly therethrough for treating the coal delivered thereto, a hammer mill for grinding coal connected to the discharge of said flash drier, a separator separately connected to the discharge of said drier, a mixing tank connected to said hammer mill and having a lower discharge end, a press connected to the lower discharge end for receiving the mixture from said mixing tank and for compressing it into individual briquets, said hammer mill having means for reducing the coal to predetermined size of from 400 to 1200 cm^2 per gram and delivering it to said mixing tank, said separator separating coarser particles from the coal from said flash drier and delivering a portion thereof to said mixing tank and means for adding a binder to the mixing tank for mixing therein, said drier comprising one or more flash driers and said hammer mill having an outlet connection to said mixer and an inner connection to the lower part of said flash drier for returning a portion of the treated coal back to said drier.

4,158,551

GASOLINE-WATER EMULSION

Arnold I. Feuerman, 5179 Corners Dr., West Bloomfield, Mich. 48033

Filed Jan. 27, 1975, Ser. No. 544,145
Int. Cl.[2] C10L *1/32*
U.S. Cl. 44—51 1 Claim

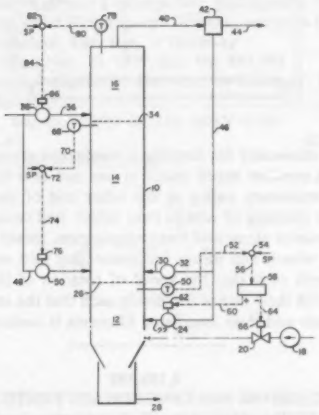
1. A fuel suitable for use in internal combustion engines, comprising an emulsion of not more than 22.0 percent by volume of water in gasoline and including about 1 percent to 3.5 percent by volume of a non-ionic ethoxylated alkylphenol wherein the alkylphenol contains from 1½ to 30 moles of ethylene oxide per mole of nonylphenol and further including about one tenth of one percent by volume of a polyethenoxy derivative of a dialkylphenol.

4,158,552

ENTRAINED FLOW COAL GASIFIER

Henry J. Blaskowski, West Simsbury, and Arun K. Mehta, Bloomfield, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 29, 1977, Ser. No. 828,353
Int. Cl.[2] C10J *3/00*
U.S. Cl. 48—210 4 Claims



1. A method of operating a cocurrent entrained flow gasifier comprising: supplying oxygen and char to a combustion zone, and burning said char, thereby producing a product gas stream; controlling the ratio of oxygen and char to produce a product gas stream temperature exceeding 2800° F. leaving said combustion zone; introducing additional char into said product gas stream at a location downstream of said combustion zone in a reducing zone, thereby gasifying at least a portion of said char in said product gas stream and endothermically cooling said gas stream to a temperature below 2000° F.; introducing fresh coal into said product gas stream in a low temperature devolatilization zone at a location downstream of said reduction zone and also downstream of any oxygen supply, whereby volatile components of said fresh coal are driven off and the product gas stream is further cooled; regulating the introduction of coal into said product gas stream in such an amount as to cool the product gas stream to a temperature less than 1400° F.; and removing unburnt char from said product gas stream for introduction into said combustion zone and reduction zone.

4,158,553

NON-SCRATCHING LIQUID SCOURING CLEANSER USING ABRASIVES WITH A MOHS HARDNESS OF GREATER THAN 3

Francis E. Chapman, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jan. 16, 1978, Ser. No. 869,416
Int. Cl.[2] C11D *9/02*
U.S. Cl. 51—304 1 Claim

1. An aqueous liquid scouring cleanser consisting essentially of:

2–10% by weight of a fatty acid soap having the formula MOOCR wherein M is selected from the group consisting of sodium, potassium and $(R_1)mHnN+$, wherein m and n are selected from 1, 2 or 3 and $m+n=4$, R_1 is an alkanol group having 1–4 carbon atoms and mixtures thereof, and R is a saturated or unsaturated alkyl group selected from the group of stearyl, aleayl and mixture thereof;

25–35% by weight of an abrasive having a Mohs hardness of greater than 3;

1–7% by weight of an anionic surfactant, nionic surfactant or mixtures thereof;

0.2–10% by weight of a thickener; and water;

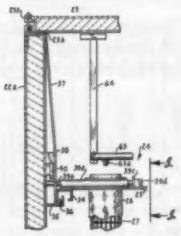
the composition having a pH within the range of 7.0–9.5 and a ratio of abrasive to soap of from 10:1 to 4:1.

4,158,554

APPARATUS FOR FILTERING PARTICULATE-LADEN GASES

Richard P. Bundy, Prairie Village, Kans.; D. Bruce Zumsteg, Raytown, and Lamson Rheinfrank, Jr., Kansas City, both of Mo., assignors to Standard Havens, Inc., Kansas City, Mo.

Division of Ser. No. 765,989, Feb. 7, 1977. This application Apr. 26, 1978, Ser. No. 900,118
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—379 3 Claims



1. A baghouse comprising:

an open top housing;

a closure member to removably seal the top of said housing;

a removable filter cartridge insertable in said housing, said cartridge including a tube sheet having a plurality of gas passages therethrough and a plurality of filtering assemblies associated with said gas passages;

a tube sheet support surface installed interiorly of said housing around the perimeter thereof;

a resilient seal disposed atop said support surface;

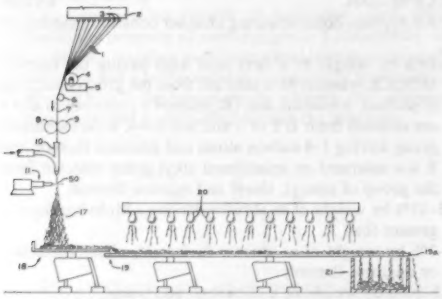
a plurality of stops secured interiorly of said housing above said support surface; and

releasable locking means including a plurality of retractable bars mounted on the upper surface of said tube sheet and extendable to underlie said stops, and inclined blocks wedged between said stops and bars to bias said tube sheet to engagement with the resilient seal of said support surface.

4,158,555
METHOD OF CUTTING OF GLASS STRAND AND PRODUCT PRODUCED THEREBY

John Kallenborn, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 19, 1975, Ser. No. 642,526
Int. Cl.[2] C03B 37/00
U.S. Cl. 65—2 24 Claims

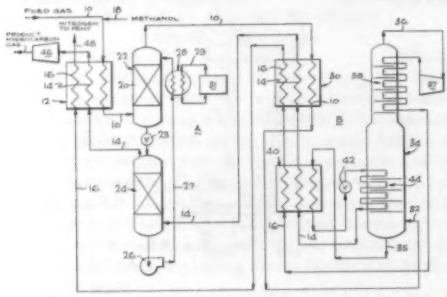


1. A method of cutting glass fiber strand comprising feeding said strand across a pulsating laser beam and cutting said strand with said pulsating laser beam, said feeding of strand being at a sufficient rate and said laser beam operating at a sufficient intensity to produce cut strands having end portions which are approximately even and fused into a single piece.

4,158,556
NITROGEN-METHANE SEPARATION PROCESS AND SYSTEM

James D. Yearout, Suite 322, 415 Herondo Ave., Hermosa Beach, Calif. 90254

Filed Apr. 11, 1977, Ser. No. 786,130
Int. Cl.[2] F25J 3/02
U.S. Cl. 62—28 20 Claims

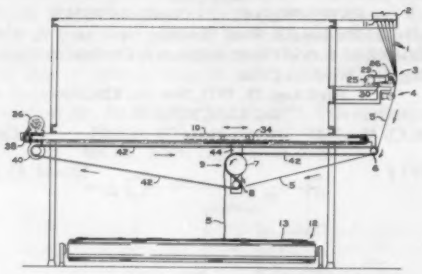


1. A process for the separation of nitrogen from a mixture of gases consisting essentially of a low boiling hydrocarbon and nitrogen, which comprises cooling said mixture of gases as feed at a pressure substantially below the critical pressure of said mixture, by regenerative heat exchange to a temperature near the saturation point of said mixture, introducing said feed into a fractionating column containing a single fractionation zone operating at a pressure substantially the same as the pressure of said feed mixture, effecting a separation of said mixture in said column into a nitrogen fraction and a hydrocarbon fraction, withdrawing nitrogen as overhead from said column, work expanding the overhead nitrogen and further cooling same, recycling said expanding and cooled nitrogen in heat exchange relation along the upper portion of said column to provide refrigeration therefor, passing said exiting nitrogen in heat exchange relation with said feed to provide said regenerative cooling of said feed, withdrawing said low boiling hydrocarbon as liquid from the lower portion of said column, flashing at least a portion of said withdrawn liquid hydrocarbon to reduce the temperature thereof, passing said portion of said cooled flashed hydrocarbon in downflow indirect heat exchange relation along the lower portion of the rectifying section of said column to vaporize said hydrocarbon, effecting a non-adiabatic differential distillation in said column, and withdrawing hydrocarbon as product, and including by-passing a minor portion of the feed prior to cooling thereof by regenerative heat exchange, and passing said by-passed portion of said feed in heat exchange relation with the stripping section of said column, and introducing the resulting cooled minor portion of the feed into said fractionating column.

4,158,557
METHOD AND APPARATUS FOR FORMING FIBER MAT

Warren W. Drummond, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 26, 1978, Ser. No. 900,353
Int. Cl.[2] C03B 37/00
U.S. Cl. 65—2 16 Claims



7. An attenuator for forming a continuous strand mat comprising a constant speed motor at one end of a traversing region, a stationary pulley at the other end of the traversing region, a plurality of wheels over which said strands pass and are attenuated along said traversing region, means for traversing said wheels and means for connecting said motor, pulley and wheels such that the speed of rotation of the wheels is varied with their rate of traversing such that the attenuation of the strands and their associated filaments is constant.

4,158,558
POTASSIUM POLYPHOSPHATE FERTILIZERS

William H. Thompson; Ralph E. Worthington, and Thomas N. Somers, all of Dublin, Ireland, assignors to Pennzoil Company, Houston, Tex.

Continuation of Ser. No. 667,776, Mar. 17, 1976, abandoned, Continuation-in-part of Ser. No. 509,063, Sep. 25, 1974, abandoned. This application Mar. 28, 1978, Ser. No. 890,949
Int. Cl.[2] C05B 1/06
U.S. Cl. 71—34 21 Claims

1. A process for the production of a potassium polyphosphate based liquid fertilizer which comprises:

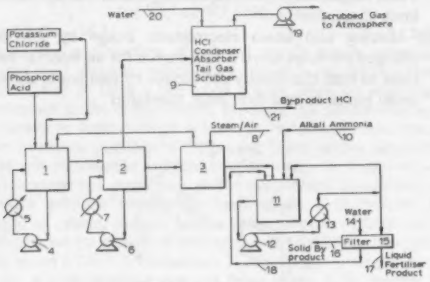
(a) reacting potassium chloride with a compound selected from the group consisting of phosphoric acid and polyphosphoric acid in a molar ratio of phosphorus to potassium in the range of from about 1:1 to 1.25:1 at a temperature below 300° C. while simultaneously blowing a gas selected from the group consisting of steam, air and inert gases through the reaction medium;

(b) removing the liberated hydrogen chloride;

(c) recovering a potassium polyphosphate reaction product;

(d) adding said reaction product to a weak solution of liquid fertilizer of water in a dissolving vessel;

(e) adjusting the pH value of the resulting solution to from about 4.0 to 10.0;
(f) cooling the pH-adjusted solution; and
(g) filtering the cooled solution to yield said liquid fertilizer and a solid by-product;



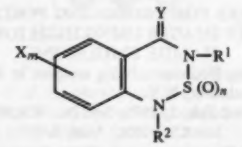
wherein the reaction in step (a) is carried out in a multicompartment reactor system in which the temperature in the first compartment thereof is the lowest and the temperature in the final compartment thereof is the highest.

4,158,559
SUBSTITUTED 2,1,3-BENZOTHIADIAZINE COMPOUNDS

Gerd Stubenrauch, Ludwigshafen; Gerhard Hamprecht, Mannheim; Bruno Wuerzer, Limburgerhof, and Guenter Retzlaff, Roemerberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

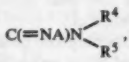
Filed Nov. 15, 1977, Ser. No. 851,781
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1976, 2656289
Int. Cl.[2] C07D *285/16*; A01N *9/14*
U.S. Cl. 71—91 **12 Claims**

1. A compound of the formula

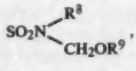


where

R^1 is alkyl of 1 to 20 carbon atoms, lower haloalkyl, cycloalkyl of 3 to 7 carbon atoms, alkenyl of 2 to 11 carbon atoms, alkynyl of 2 to 8 carbon atoms, lower haloalkenyl, lower haloalkynyl, lower alkoxyalkyl, lower alkylmercaptoalkyl, lower alkyl- and dialkylcarbamoylalkyl, lower alkoxycarbonyl, lower alkoxycarboalkyl, lower alkoxycarboalkenyl, lower alkanoylalkyl, phenyl, phenyl substituted by halogen, methyl or halomethyl, or pyrrolidinyl,
R^2 is CN, SCN,

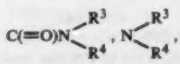


$C(=N—OR^4)R^3$, $S(=O)OR^3$, $S(=O)_2OR^3$, $Si(R^6)_2R^7$,



or $SCCl_2F$,

X is halogen, NO_2, lower alkyl, halo lower alkyl, cycloalkyl, benzyl, phenyl, CN, SCN, CO_2R^3,



$Y'R^4$, SO_2R^3, SO_2OR^3,

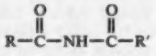
CCl_3, CF_3, $C(=O)R^3$ or $Y''CF_2C(Z)_3$,
R^3 is hydrogen, lower alkyl, phenyl, or phenyl substituted by halogen, methyl or nitro,
R^4 and R^5 being identical or different and each having the meanings of R^3 and are additionally, but not simultaneously, lower alkanoylalkyl,
R^6 and R^7 being identical or different and each having the meanings of R^3 with the exception of hydrogen,
R^8 and R^9 being identical or different and each having the meanings of R^3 with the exception of hydrogen and phenyl,
A having the meanings of R^3 or is OR^3, $N(R^3)_2$, $OC(=O)NHR^3$ or $OC(=O)R^3$,
each Y, Y' and Y''' is independently hydrogen, oxygen or sulfur,
each Z is independently hydrogen, fluorine, bromine, chlorine or iodine,
m is one of the integers 0, 1, 2, 3 and 4, and
n is the integer 2.

4,158,560
BROAD SPECTRUM HERBICIDAL DIACYLIMIDE COMPOSITIONS

Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Nov. 17, 1977, Ser. No. 852,460
Int. Cl.[2] A01N *9/20*
U.S. Cl. 71—118 **2 Claims**

1. A method of controlling agricultural weeds which comprises applying thereto a herbicidially effective amount of a diacylimide compound having the formula:



where R is a 1,2-dihaloalkenyl group having 2 carbon atoms, and R' is selected from the group consisting of alkyl and monohaloalkyl groups having from 1–3 atoms.

4,158,561
METHOD FOR PREPARING OXIDE COATED MICROLAMINATION PARTICLES

Norman M. Pavlik, Wilkins Township, Allegheny County, and John Sefko, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1978, Ser. No. 896,533
Int. Cl.[2] H01F *1/09*
U.S. Cl. 75—0.5 BA **10 Claims**

1. A method of preparing insulated microlamination particles for use as electrical components, comprising the steps of
(a) placing a plurality of particles of microlaminations in a furnace which particles are substantially of an elongated rectangular cross-section and of ferrous alloy, and
(b) heating the particles to a temperature range of from about 1350° to about 1450° F. in an atmosphere having an air to natural gas ratio of from about 10.5:1 to about 8:1 for sufficient time to decarburize the particles to less than

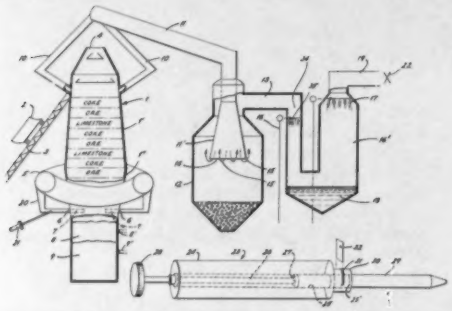
0.005% carbon and to form on the particle surfaces an oxide coating of from about 0.01 to about 0.10 mils.

4,158,562

BLAST FURNACE TESTING AND CONTROL METHODS

Terrence W. Mattioli, King of Prussia, and Glenn D. Williams, Berwyn, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Apr. 26, 1978, Ser. No. 900,221
Int. Cl.[2] C21B 7/00
U.S. Cl. 75—41 31 Claims



1. A method for evaluating the operation of a blast furnace system having wet scrubber means for wet scrubbing particulate matter from blast furnace off-gases, said wet scrubber means being located downstream of blast furnace means in the direction of flow of the off-gases, which method comprises evaluating the carbon content of the off-gases at at least one test point located downstream of the wet scrubber means in the direction of flow of the off-gases.

4,158,563

LOW ANTIMONIAL LEAD ALLOY FOR MAKING GRIDS FOR USE IN MAINTENANCE FREE BATTERIES

Ranna K. Hebbar, Roosevelt; M. Vikram Rao, Princeton Junction, and George S. Foerster, Hightstown, all of N.J., assignors to N L Industries, Inc., New York, N.Y.

Filed Oct. 11, 1977, Ser. No. 840,830
Int. Cl.[2] C22F 11/10
U.S. Cl. 75—166 C 7 Claims

1. A lead alloy in the cast condition consisting essentially of 1.3 to less than 2.0 weight percent antimony, 0.05 to 0.45 weight percent arsenic, 0.1 to 0.5 weight percent tin, 0.02 to 0.09 weight percent copper, 0.002 to 0.012 weight percent sulfur, balance lead.

4,158,564

METHOD AND APPARATUS FOR CONTROLLING THE GRAY SCALE RESPONSE OF A MULTILAYER IMAGE FORMING SCREEN

Kenneth W. Gardiner, Menlo Park, and Gerald L. Pressman, San Jose, both of Calif., assignors to Electroprint, Inc., Sunnyvale, Calif.

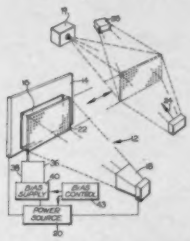
Continuation of Ser. No. 774,363, Apr. 4, 1977, abandoned, which is a continuation of Ser. No. 442,698, Feb. 15, 1974. This application Jan. 3, 1978, Ser. No. 868,098
Int. Cl.[2] G03G 13/048
U.S. Cl. 96—1 R 7 Claims

1. The method of limiting the gray scale response of an electrostatic printer having a multilayered apertured screen comprising a photoconductive layer and at least two electrically conductive layers separated by an insulator for receiving an electrostatic latent image of a source image, a source for projecting charged particles toward said screen for modulated transmission therethrough towards a copy medium in accordance with said latent image, a voltage supply for providing an internal bias voltage said first and second conductive layers of said screen and means for controlling the magnitude of said bias voltage, said method comprising the steps of:

(a) impressing an electrostatic latent image on said screen; thereafter

(b) adjusting said control means to provide a bias voltage of a first magnitude V_S corresponding to a first image density limit; thereafter

(c) altering said latent electrostatic image by directing charged particles toward said screen for an interval sufficient to limit the density producible by said latent electrostatic image to said first limit; thereafter



(d) adjusting said bias voltage control means to provide an internal bias voltage of a second magnitude V_P corresponding to a second image density limit; and thereafter

(e) directing charged particles toward said screen for duplication interval, the passage of said charged particles during said duplication interval through the screen apertures in areas of image density ranging beyond one of said first and second limits being blocked by the corresponding one of said bias voltages V_P, V_S and the passage of charge particles through the screen apertures in areas of image density corresponding to the other of said first and second limits being substantially uniform over the screen image area.

4,158,565

PROCESSES FOR PRODUCING POSITIVE OR NEGATIVE DYE IMAGES USING HIGH IODIDE SILVER HALIDE EMULSIONS

Joe E. Maskasky, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 2, 1978, Ser. No. 874,600
Int. Cl.[2] G03C 7/00, 5/64
U.S. Cl. 96—29 D 19 Claims

1. A method of forming a dye image employing an imagewise exposed photographic element comprising:

(i) a support and, coated thereon,

(ii) at least one radiation-sensitive color-forming layer unit, said layer unit including

(a) a substantially uniform distribution of a catalyst capable of catalyzing a redox reaction between a peroxide oxidizing agent and a dye-image-generating reducing agent and

(b) radiation sensitive, negative-working silver halide emulsion containing at least 25 mole percent silver iodide based on the total silver halide, said method comprising the steps of

(1) imagewise poisoning said catalyst with iodide ion by developing said silver iodide containing silver halide emulsion so as to imagewise release said iodide ion thereby forming a positive catalytic image; and

(2) thereafter catalyzing with said positive catalytic image, a redox reaction between a peroxide oxidizing agent and a dye-image-generating reducing agent wherein said oxidizing agent and said reducing agent are chosen so that they are essentially inert to oxidation-reduction in the absence of a catalyst.

4,158,566

AQUEOUS PHOTORESIST COMPRISING CASEIN AND METHYLOL ACRYLAMIDE

Abraham Goldman, Kendall Park, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 13, 1978, Ser. No. 877,481
Int. Cl.² G03C *5/00, 1/68*
U.S. Cl. 96—36.2 **2 Claims**

1. In the manufacture of printed circuit boards wherein a copper clad phenolic paper board panel is photolithographically etched to form a patterned copper layer by applying a photoresist to the copper layer, exposing the photoresist layer to ultraviolet light through a mask, developing the photoresist layer to expose portions of the copper layer, curing the photoresist and etching the exposed copper away, the improvement which comprises employing as the photoresist compostion an aqueous solution containing from about 4–12 percent by weight of casein, sodium borate in an amount of from about 8–20 percent by weight of the casein and so that the final pH is from about 6.7 to 7.3; from about 2–20 percent by weight of the casein of a dichromate salt and from about 5–30 percent by weight of the casein of N-methylol acrylamide.

4,158,567

METHOD OF SCREEN GRAVURE PHOTOENGRAVING

Kokichi Honma, deceased, late of Wako, Japan (by Kenichiro Honma, legal representative), and Yoshio Kameyama, Tokyo, Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 688,038, May 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 486,776, Jul. 9, 1974, abandoned. This application Oct. 19, 1977, Ser. No. 843,558
Claims priority, application Japan, Jul. 9, 1973, 48-73349; Jun. 6, 1974, 49-64465; Jun. 14, 1974, 49-67700; Jun. 14, 1974, 49-67701
Int. Cl.² G03C *5/00*; G03F *7/00, 5/00*
U.S. Cl. 96—36.3 **6 Claims**

1. A method of screen gravure photoengraving using a half-tone positive of the planographic type or the relief type which comprises performing the separate steps of:

(a) exposing a photosensitive resist material to a light source through a gravure screen having desired number of transparent crosslines;

(b) exposing said photosensitive resist material to the light source through said half-tone positive of the planographic type or the relief type;

(c) exposing said photosensitive resist material to the light source by interposing a diffusion sheet between said half-tone positive of the planographic type or the relief type and said photosensitive resist material; and

succeeding plate making steps, in which the order of said exposing steps (a), (b) and (c) are not fixed.

4,158,568

CORROSION RESISTANT REFRACTORY MIX

Richard G. LaBar, Export, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 759,984, Jan. 17, 1977, Pat. No. 4,088,502, which is a continuation-in-part of Ser. No. 639,993, Dec. 12, 1975, abandoned. This application May 8, 1978, Ser. No. 903,786
The portion of the term of this patent subsequent to May 9, 1995, has been disclaimed.
Int. Cl.² C04B *35/02, 7/32*
U.S. Cl. 106—64 **4 Claims**

1. A particulate refractory mixture capable of mixture with water to form a refractory having enhanced corrosion resistance for usage in the production of ultra high purity aluminum consisting essentially of: 90 to 98.5% by weight refractory material and 1.5 to 10% by weight of a zinc borosilicate frit consisting essentially of 50 to 60% by weight zinc oxide, 20 to 40% by weight boron oxide, 8 to 12% by weight silicon oxide and 0 to 10% by weight aluminum oxide with less than 0.5% by weight impurities in the frit and not more than 1% by weight impurities in the refractory mixture.

4,158,569

FUSED REFRACTORY

Jack A. Brothers; Robert C. Doman, both of Painted Post, and Robert N. McNally, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 10, 1978, Ser. No. 922,826
Int. Cl.² C04B *35/10, 35/12*
U.S. Cl. 106—66 **6 Claims**

1. Dense fused refractory material having

(a) a microstructure consisting essentially of at least 70 volume percent chrome-containing corundum solid solution crystal phase, at least about 5 volume percent oxidic secondary crystal phases mainly comprising chrome-containing alkaline earth metal hexaluminate solid solution, and less than 10 volume percent metal phase; and

(b) an analytical composition, by weight, consisting essentially of:

at least 90% Al_2O_3 plus Cr_2O_3,

20–60% Cr_2O_3,

1–4% MO where M is Ca, Ba, Sr, Mg, Fe and mixtures thereof,

0.4–3.5% CaO, BaO, SrO and mixtures thereof,

not greater than 3% MgO,

not greater than 3.5% FeO,

less than 5% SiO_2,

up to 0.5% fluorine,

less than 1.5% R_2O where R is Li, Na, K, Rb, Cs and mixtures thereof,

up to 2% TiO_2, and

up to 3% ZrO_2.

4,158,570

PREPARING MAGNESIUM OXYCHLORIDE AND/OR OXYSULFATE CEMENTS

Robert G. Irwin, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 28, 1978, Ser. No. 937,297
Int. Cl.² C04B *9/02, 9/04*
U.S. Cl. 106—106 **6 Claims**

1. In a method of preparing magnesium oxychloride or magnesium oxysulfate cements in which magnesium oxide is mixed with magnesium chloride solutions or magnesium sulfate solutions in proportions sufficient to produce magnesium oxychloride or magnesium oxysulfate cements employing high shear blending techniques, the improvement comprising mixing at least about 75 percent by weight of the requisite magnesium oxide to be used with up to 90 percent of the magnesium chloride solution or magnesium sulfate solution required under low shear mixing conditions thus keeping the temperature of the mixture below 180° F. without external cooling until mixing is impeded by the viscosity of the mixture, adding the remaining magnesium oxide to the mixture and blending it therewith under high shear until a homogeneous mixture is obtained, subsequently adding the remaining magnesium chloride solution or magnesium sulfate solution to the homogeneous mixture so obtained and blending the mixture so formed under high shear mixing conditions to obtain a homogeneous magnesium oxychloride or magnesium oxysulfate cement.

4,158,571

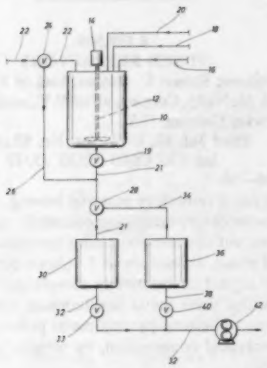
NOVEL BINGHAM FLUIDS

Thomas J. Lynch, Houston, and Robert J. Rowatt, Orange, both of Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 838,776, Oct. 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 835,271, Sep. 21, 1977, abandoned. This application May 19, 1978, Ser. No. 907,445

Int. Cl.[2] C08F *4/02*; C08J *3/20*; C08K *9/00*

U.S. Cl. 106—271 25 Claims



1. A polymerization-initiating, polymerization-controlling or polymerization-modifying Bingham fluid composition suitable for continuous direct addition to a continuous olefin polymerization reaction system, said composition being a solid at ambient temperature and capable of flow under an applied pressure, said composition consisting essentially of:

(a) a continuous solid phase consisting essentially of an intimate mixture of a wax and a liquid hydrocarbon, and

(b) at least one functional material capable of initiating, controlling, or modifying a polymerization reaction uniformly dispered throughout the continuous solid phase of (a).

4,158,572

PROCESS OF PRODUCING A PHTHALOCYANINE PIGMENT

John B. Blackburn, Beith; Alexander M. Irvine, Dean Park; Michael Sutcliffe, Glasgow, and George McLaren, Houston, all of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 11, 1977, Ser. No. 840,886

Claims priority, application United Kingdom, Oct. 15, 1976, 42858/76

Int. Cl.[2] C08J *3/00*

U.S. Cl. 106—288 Q 14 Claims

1. A process of producing a β-phthalocyanine pigment comprising

(a) dry grinding a crude phthalocyanine to obtain an α-/β-phthalocyanine,

(b) stirring the product of stage (a) with an aqueous medium, in the absence of an organic solvent, and wherein said aqueous medium contains a surfactant exhibiting a net non-ionic character or said surfactant complexed with an ionic surfactant, to convert said α-/β-phthalocyanine to the β-phthalocyanine form and

(c) isolating the resulting β-phthalocyanine pigmentary product.

4,158,573

CONICAL CENTRIFUGAL BASKET

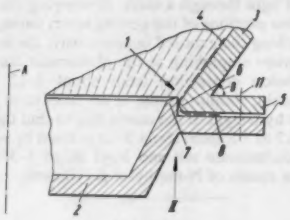
Volkmar Hentschel, and Gustav Warner, both of Brunswick, Fed. Rep. of Germany, assignors to Braunschweigische Maschinenbauanstalt, Brunswick, Fed. Rep. of Germany

Filed Mar. 10, 1978, Ser. No. 885,327

Claims priority, application Fed. Rep. of Germany, May 5, 1977, 7714228

Int. Cl.[2] B01D *21/26, 43/00*; B04B *1/00*; C13F *1/10*

U.S. Cl. 127—19 6 Claims



1. A conical centrifugal basket for continuously operating centrifuges having a vertical axis, comprising at least two axial basket sections each having a large and a small diameter arranged for axial alignment to form said conical basket, each basket section comprising flange means for axially interconnecting the basket sections to form the basket, said flange means extending substantially radially outwardly relative to said vertical axis, screen means operatively held in said basket, said screen means comprising at least one screen member having at its small diameter end screen collar means extending substantially radially outwardly relative to said vertical axis, said screen collar means forming an angle of less than 90° relative to said screen member, and means clamping said screen collar means between the flange means of two adjacent basket sections.

4,158,574

HYDROLYZED AMYLACEOUS PRODUCT AND PROCESS OF MAKING THE SAME

Robert G. Cummisford, Brookfield; Richard J. Wasielewski, Milwaukee, and Robert K. Krueger, Sheboygan, all of Wis., assignors to Krause Milling Company, Milwaukee, Wis.

Division of Ser. No. 551,882, Feb. 21, 1975, Pat. No. 4,013,629. This application Nov. 12, 1976, Ser. No. 741,188

Int. Cl.[2] C13L *1/08*

U.S. Cl. 127—32 8 Claims

1. The method of manufacturing amylaceous material comprising the steps in the following sequence:

(a) hydrolyzing a material selected from the group consisting of corn flour, corn meal, corn grits, corn starch, sorghum flour, sorghum meal and sorghum grits at moistures between 5 and 12% by weight of the humidified starting material using between 0.1 and 2% by weight acid;

(b) adjusting the pH of the acid hydrolyzed amylaceous material to between pH 3 and 6 obtained on a 10% solids water slurry;

(c) gelatinizing the pH adjusted acid hydrolyzed amylaceous material at moisture levels between 15 and 40% and at temperatures of between 212° and 400° F.;

(d) removing water from the gelatinized product;

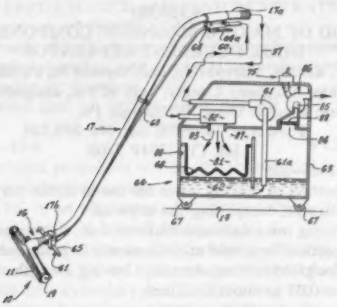
(e) comminuting the dried amylaceous mass to a flour.

4,158,575

CLEANING AND DISINFECTING HARD SURFACES

Robert L. Townsend, Irvine, Calif., assignor to Purex Corporation, Lakewood, Calif.

Filed Apr. 11, 1977, Ser. No. 786,352
Int. Cl.[2] B08B 5/04, 7/04
U.S. Cl. 134—6 13 Claims



1. In the method of removing soils and bacteria from a hard floor surface, the steps that include

(a) providing two upright, longitudinally spaced, resiliently flexible strips extending generally laterally horizontally and parallel to one another,

(b) applying suction to the space between the strips so that the lower edge portions engage the hard floor surface and flex,

(c) bodily displacing the strips longitudinally in one direction in such proximity to the floor surface while continuing said suction application to an extent that the lower edge portions of the strips flex relatively in the opposite direction and the leading strip in said one direction passes soils relatively therebeneath into the space between the strips for suction removal from said space,

(d) applying disinfectant liquid to the floor surface outside the space between the strips to wet the surface, and

(e) bodily displacing the strips longitudinally in the opposite direction and in such proximity to the wetted floor surface and while further continuing said suction application to an extent that the lower portions of the strips flex relatively in said one direction and the leading strip in said opposite direction passes said applied liquid relatively therebeneath into the space between the strips for suction removal from said space.

4,158,576

TREATING SURFACES WITH LIQUIDS

Erich Butz, Offenbach, Fed. Rep. of Germany, assignor to Kolsch-Foelger-Werke AK., Siegen, Fed. Rep. of Germany

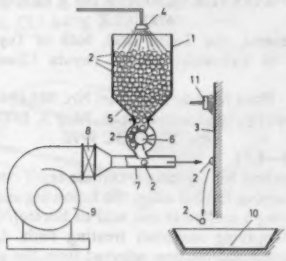
Filed Oct. 11, 1977, Ser. No. 840,737
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1977, 2645688
Int. Cl.[2] B08B 7/00, 7/04
U.S. Cl. 134—7 6 Claims

1. Process for treating a vertical surface with a liquid which comprises:

(a) storing porous elastic particles in a hopper adjacent the surface to be treated,

(b) applying treating liquid to said particles in the hopper,

(c) metering said particles seriatim from the hopper in a controlled positive manner by a paddle-wheel means to a conduit, which conduit includes a nozzle directed toward said surface, and



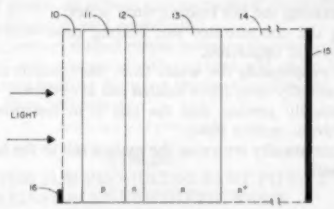
(d) creating an air stream in the conduit toward the nozzle for projecting the particles in the conduit toward said surfaces.

4,158,577

HIGH OUTPUT SOLAR CELLS

Arthur G. Milnes, c/o Carnegie-Mellon University, Schenley Park, Pittsburgh, Pa. 15213

Filed Jul. 5, 1978, Ser. No. 922,068
Int. Cl.[2] H01L 31/06
U.S. Cl. 136—89 SJ 19 Claims



1. A multiple layer high output solar cell comprising superimposed layers in pn_1n_2 form of semiconductor compounds selected from the group consisting of group III-V compound semiconductors and their group II-V-V_2 analogs, the pn_1 junction being a homojunction of a compound having a primary electron conduction band of minimum bandgap energy and at least one secondary electron conduction band of higher bandgap energy, the p layer being doped so as to create a field therein sufficient to divert "hot" photo-induced electrons from the primary into the secondary electron conduction band of the n_1 layer and the n_2 layer being adjusted in composition so that its conduction band energy minima are approximately equal to the secondary electron conduction band energy, whereby "hot" electrons in the secondary electron conduction band pass into the n_2 layer.

13. The solar cell of claim 1 in which the pn_1 homojunction compound is GaAs.

14. The solar cell of claim 13 in which the p layer is zinc doped GaAs.

15. The solar cell of claim 13 in which the n_2 layer is Al_x-$Ga_{1-x}As$ where x is between 0.1 and 0.5.

4,158,578

METHOD FOR FORMING A CARBIDE LAYER OF A VA-GROUP ELEMENT OF THE PERIODIC TABLE OR CHROMIUM ON THE SURFACE OF A FERROUS ALLOY ARTICLE

Noboru Komatsu, and Tohru Arai, both of Toyoake, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed May 4, 1978, Ser. No. 902,696
Claims priority, application Japan, May 9, 1977, 52/52800
Int. Cl.[2] C23C 9/10
U.S. Cl. 148—6.11 41 Claims

1. In a method for forming a carbide layer on an article of carbon-containing ferrous alloy, the following sequential steps:
(a) preparing a molten (boric acid or borate)/CFE-oxide/(-boron-supplying material) treating bath, CFE being a carbide-forming element selected from the group consisting of a Va group element and chromium and the boron-supplying material being one wherein boron is not bound to oxygen,
(b) immersing the article into the molten treating bath,
(c) maintaining said article in said molten treating bath for a period sufficient to form a carbide layer of said CFE on the surface of said article and
(d) removing said article from said molten treating bath.

4,158,579

METHOD FOR RECYCLING HEAT TREATING SALTS

Robert W. Foreman, Bloomfield Hills, and Gajen P. Dubal, Sterling Heights, both of Mich., assignors to Park Chemical Company, Detroit, Mich.

Continuation-in-part of Ser. No. 670,152, Mar. 25, 1976, abandoned. This application Nov. 18, 1977, Ser. No. 852,981
Int. Cl.[2] C21D 1/46
U.S. Cl. 148—20 18 Claims

1. An automatic on-line method for reclaiming water soluble heat treating salts from a rinse bath into which the salts and water soluble impurities have been introduced by dragout from a molten salt heat treating bath for treating metallic articles comprising the steps of:
concentrating the salt bearing rinse water;
treating the concentrated salt bearing rinse water for the removal of impurities,
further evaporating the water from the concentrate until a substantially anhydrous molten salt is obtained;
automatically sensing that the salt is in the substantially anhydrous molten state,
and automatically returning the molten salt to the heat treating bath.

4,158,580

METHOD OF MAKING PRESSED MAGNETIC CORE COMPONENTS

William T. Reynolds, Peters Township Allegheny County, and Norman M. Pavlik, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1978, Ser. No. 896,535
Int. Cl.[2] H01F 1/08
U.S. Cl. 148—104 4 Claims

1. A method of making pressed magnetic core components for use in electrical apparatus, comprising the steps of:
(a) severing microlaminations from thin, flat strips of ferromagnetic alloys having an elongated rectangular cross-section and up to about 0.20 inch in length,
(b) annealing the microlaminations in decarburizing atmosphere at a temperature range of from about 1000° F. to about 1650° F. for about 30 minutes in moist hydrogen having a dew point of about +120° F. to improve the magnetic characteristics by reducing carbon content to less than 0.010%,
(c) coating the microlaminations with a layer of hydrated magnesium silicate whereby to provide a chemically stable non-volatile, non-flammable, non-toxic compact having low die and punch friction packing factors,
(d) compressing microlaminations into a solidified compact, and
(e) annealing the solidified compact at a temperature of from about 537° C. to about 900° C. to obtain high permeability and low coercive force values.

4,158,581

METHOD OF MAKING MAGNETIC COMPONENT FOR DIRECT CURRENT APPARATUS

Robert F. Krause, Murrysville, and Norman M. Pavlik, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1978, Ser. No. 896,534
Int. Cl.[2] H01F 1/08
U.S. Cl. 148—105 5 Claims

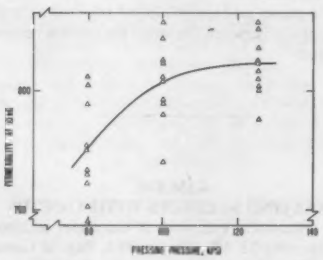
1. A method of making cores for use in direct current magnetic apparatus, comprising the steps of:
(a) forming microlaminations from thin, flat strips of ferromagnetic alloys, said microlaminations being substantially of elongated rectangular shape having a length of between about 0.05 to about 0.02 inch,
(b) annealing said microlaminations in decarburizing and deoxidizing atmosphere at a temperature range of from about 1325° F. to about 1650° F. for a time period of up to about 2 hours in wet hydrogen having a dew point in excess of about +60° F. to improve the magnetic characteristics and to reduce the carbon to less than 0.01%,
(c) pressing the microlaminations into a predetermined configuration of the desired core, and
(d) annealing the core at a temperature of from about 1400° F. to about 2200° F. in a non-oxidizing atmosphere to obtain high permeability and low coercive force values, thereby providing a magnetic compact having uncoated, non-oxidized microlaminations and having superior magnetic quality for direct current apparatus.

4,158,582

METHOD OF MAKING PRESSED MAGNETIC CORE COMPONENTS

Robert F. Krause, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1978, Ser. No. 896,526
Int. Cl.[2] H01F 1/08
U.S. Cl. 148—120 7 Claims



1. A method of making pressed magnetic core components having improved magnetic characteristics for use in electrical apparatus, comprising the steps of:
(a) forming microlaminations from ferrous alloy stock,
(b) annealing said microlaminations in decarburizing and deoxidizing atmosphere to improve the magnetic characteristics and to reduce the carbon to less than 0.01%,
(c) coating said microlaminates with electrically insulating material,
(d) assembling said microlaminations within a mold of predetermined configuration,

(e) compacting said microlaminations into the desired configuration of a magnetic core compact,
(f) annealing said core to relieve stresses, and
(g) recompacting said magnetizable compact to improve the magnetic characteristics.

4,158,583

HIGH PERFORMANCE AMMONIUM NITRATE PROPELLANT

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Floyd A. Anderson, Pasadena, Calif.

Filed Dec. 16, 1977, Ser. No. 861,390
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.4 **9 Claims**

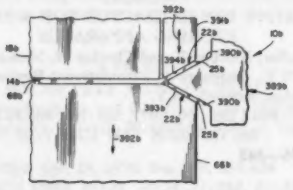
1. A solid rocket propellant having greatly reduced hydrogen chloride emission comprising:
about 10–15% of an elastomeric butadiene polymer binder containing over 85% by weight solids;
the solids including 40% to 70% ammonium nitrate as a primary oxidizer, 5% to 20% powdered metal fuel and 5% to 35% of a secondary oxidizer including 5% to 25% ammonium perchlorate and 10% to 20% of an organic nitramine oxidizer.

4,158,584

ULTRASONIC METHOD FOR MANUFACTURING BRASSIERE TAPES

Robert A. Clarke, White Plains; Peter J. Kuhl, Jackson Heights, and Richard H. Paschke, Medford, all of N.Y., assignors to Cavitron Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 736,786, Oct. 29, 1976, Pat. No. 4,045,271. This application Aug. 18, 1977, Ser. No. 825,756
Int. Cl.[2] B29C *27/08*; B32B *31/20*
U.S. Cl. 156—73.1 **8 Claims**



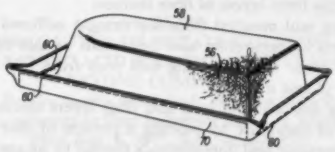
1. The method of fabricating tapes from an elongated continuous strip of material formed of flexible layers capable of being ultrasonically welded, the tapes having one edge terminating in a pair of overlapping tabs, the method comprising the steps of
A. interposing between said layers of the portion of said strip forming said tabs a stationary anvil means for permitting individual layers of material in each of said tabs to be simultaneously welded together, while preventing said tabs from being welded to each other.
B. engaging said portion of said strip between oppositely disposed horns vibrating at an ultrasonic rate with said stationary anvil means aligned therewith, and engaging the remainder of said strip between a movable anvil means and one of said horns, said horns and said anvil means togetherengaging said strip to form a weld transversely thereacross
C. effecting reciprocation of said movable anvil means and said horns between said strip-engaging and an open position in which said anvil means and said horns are spaced apart for receiving said strip therebetween, and
D. advancing said strip between said horns and anvil means intermittently in timed relationship of said reciprocation thereof to said open position.

4,158,585

WASHBASIN LINER METHOD AND ARTICLE

Melvin A. Wright, 4517 Seagrave Ave., Richmond, Va. 23234

Filed Feb. 2, 1977, Ser. No. 764,785
Int. Cl.[2] A47K *3/02*; B32B *31/14*
U.S. Cl. 156—94 **17 Claims**



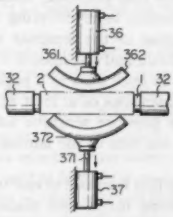
1. A method of renovating a washbasin comprising the steps of:
forming a plug at said washbasin to be renovated by applying a first hardening material to the interior surface of said washbasin, allowing the hardening material to harden, and removing said plug from said washbasin;
applying a second hardening material to the exterior surface of said plug, and allowing said second hardening material to harden to form a master mold which is removed from said plug;
heating a sheet of plastic;
thermoforming said sheet of heated plastic to have a shape substantially identical to that of the interior of the washbasin by sucking said heated sheet of plastic into said master mold by means of a vacuum applied through said master mold;
removing said thermoformed sheet of plastic from said master mold and applying reinforcing resinous backing to the back side of said thermoformed sheet of plastic, said reinforcing resinous backing including a strengthening filler mixed therewith;
applying a water-resistant adhesive between substantially the entire interior surface of said washbasin and substantially the entire backside of said reinforced thermoformed sheet of plastic to adhere said reinforced thermoformed sheet of plastic to said washbasin;
said thermoformed shaped plastic having a thickness of from 50 to 125 mils substantially throughout and said reinforcing resinous backing having a thickness within the range of from 75 to 150 mils.

4,158,586

METHOD FOR PRODUCING BENT PIPE OF REINFORCED SYNTHETIC RESIN

Fumio Usui, 441, Shimofusa, Tama-ku, Kawasaki-shi, Kanagawa-ken, Japan

Division of Ser. No. 717,560, Aug. 25, 1976, Pat. No. 4,080,141. This application Nov. 14, 1977, Ser. No. 851,589
Int. Cl.[2] B29C *27/14, 13/00*
U.S. Cl. 156—175 **1 Claim**



1. A method for producing a bent pipe of reinforced synthetic resin, said method comprising the steps of:
preparing a flexible and elastic tubular mandrel of prescribed dimension and having embedded therein reinforcing metallic wires;

supporting said mandrel in a straight stiffened position by inserting a pair of rods into respective opposite ends of said mandrel and connecting the inner ends of said rods to each other within said mandrel;

winding threads of fiber materials impregnated with a thermo-hardening synthetic resin around said mandrel to thereby form layers of fiber thereon;

releasing said mandrel from the straight stiffened position thereof by separating said inner ends of said rods from each other and extracting said rods from said opposite ends of said mandrel;

bending said mandrel with said fiber layers thereon into a desired curvature by pushing a portion of said mandrel intermediate said opposite ends thereof by means of a pair of molds, while supporting said opposite ends of said mandrel by chucks;

heat-hardening said synthetic resin while maintaining said mandrel in the bent position, to thereby form a bent pipe of reinforced cured synthetic resin; and

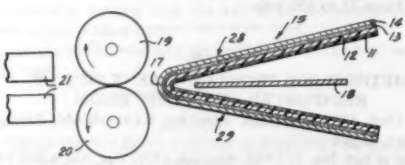
extracting said mandrel from said bent pipe thus formed and hardened.

4,158,587

METHOD OF PRODUCING LAMINATED SHEETS USING LAMINATED POUCH SUPPORT

Jack L. Keller, Lincolnshire, and Jerome J. Wiermanski, Wayne, both of Ill., assignors to General Binding Corporation, Northbrook, Ill.

Filed Sep. 26, 1977, Ser. No. 836,587
Int. Cl.[2] B32B *31/16*
U.S. Cl. 156—216 **5 Claims**



1. A method for economically producing large size laminated sheets, comprising the steps of:

(a) providing a thin film polyester laminate having a heat reactivatible adhesive layer covering one side thereof, a combined thickness of the laminate and adhesive layer being less than 5 mils and dimensions of the laminate being sufficient to cover both sides of a paper sheet to be laminated having dimensions of at least 8½" by 11";

(b) adhering by a pressure sensitive adhesive a stiffening carrier sheet to the side of the laminate opposite the one side;

(c) folding the thin film laminate in half to form a film pouch of first and second leaves and placing the sheet to be laminated between the folds facing the heat reactivatible adhesive layers of the leaves;

(d) processing the pouch and sheet to be laminated in a laminating machine to produce a laminated sheet; and

(e) pulling away the carrier sheet and pressure sensitive adhesive from the laminated sheet.

4,158,588

COPOLYMERS OF ETHYLENE, PROCESS FOR PRODUCING THEM AND THEIR USE

Hans-Walter Birnkraut, Oberhausen, and Werner Kluy, Bochum-Stiepel, both of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Continuation of Ser. No. 754,231, Dec. 27, 1976, abandoned, which is a continuation of Ser. No. 620,820, Oct. 8, 1975, abandoned. This application Mar. 23, 1978, Ser. No. 889,357
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1974, 2448342
Int. Cl.[2] C09J *3/02*; B05D *3/02, 5/10*
U.S. Cl. 156—331 **16 Claims**

1. A method of coating a material comprising applying a copolymer consisting essentially of

(a) a first comonomer comprising 70–90 parts by weight of ethylene per 100 parts by weight of said copolymer.

(b) a second comonomer said second comonomer being present in an amount of 0.5 to 15 parts by weight per 100 parts by weight of said copolymer, said second comonomer comprising

(1) an alkyl ester wherein the alkyl group contains up to 8 carbon atoms, of an unsaturated monocarboxylic acid having 3 to 6 carbon atoms, or

(2) a vinyl ester of a saturated carboxylic acid having up to 3 carbon atoms,

(c) a third comonomer comprising an amount of an amide of an unsaturated monocarboxylic acid having 3 to 6 carbon atoms, said amount being 0.5 to 10 parts by weight per 100 parts by weight of said copolymer and,

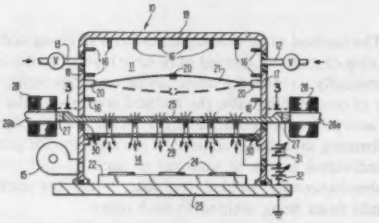
(d) a forth comonomer comprising an amount of a vinyl ether having up to 10 carbon atoms, said amount being 0.1 to 5 parts by weight per 100 parts by weight of said copolymer, to a first material to form a coated material.

4,158,589

NEGATIVE ION EXTRACTOR FOR A PLASMA ETCHING APPARATUS

John H. Keller, Newburgh, and Charles M. McKenna, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 865,811
Int. Cl.[2] B01K *1/00*; C23F *1/02*
U.S. Cl. 156—345 **9 Claims**



6. In a plasma apparatus, for reactive ion etching, in which a plasma is separated from a substrate disposed in said apparatus and in which a potential is applied between said plasma and said substrate to attract species from the plasma and direct the species to said substrate, comprising the improvement of

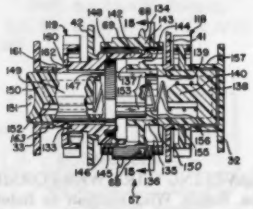
means for establishing the polarity of said potential such that the species withdrawn from the plasma are negative ions; and

means for generating a magnetic field between said plasma and said substrate of a magnitude sufficient to retain electrons in the plasma, but insufficient to prevent the negative ions from reaching the substrate.

4,158,590
HAND-HELD LABELER

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 790,519, Apr. 25, 1977, Pat. No. 4,116,747.
This application Feb. 7, 1978, Ser. No. 875,837
Int. Cl.[2] B41J *1/20, 1/24*
U.S. Cl. 156—384 12 Claims

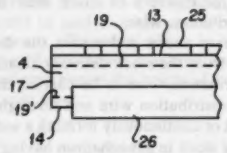


1. Hand-held apparatus for applying labels, comprising: means for delaminating pressure sensitive labels from a web of supporting material, means for applying delaminated labels, a rotatably mounted feed wheel, the feed wheel having teeth at its periphery engageable with the web for drawing the web about the delaminating means, a drive wheel, a first clutch member secured against rotation relative to the drive wheel and a second clutch member cooperable with the first clutch member, means providing a drive connection between the second clutch member and the feed wheel for keying the second clutch member and the feed wheel against relative rotation but enabling relative axial movement between the second clutch member and the feed wheel, and spring means for urging the second clutch member into a first axial position in clutching engagement with the first clutch member but the spring means being yieldable to enable the second clutch member to be moved to a second axial position out of clutching engagement with the first clutch member, the first and second clutch members being rotatable relative to each other in the second axial position, and means for driving the drive wheel.

4,158,591
SOLAR CELL MANUFACTURE

James E. Avery, Burbank, and Charles F. Gay, Tujunga, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 24, 1978, Ser. No. 899,436
Int. Cl.[2] H01L *21/22, 21/24, 21/263, 21/308*
U.S. Cl. 156—643 11 Claims



1. A method for manufacturing solar cells comprising:
(a) introducing an active impurity of an opposite conductivity imparting type into at least one major face and the edge face of individual semiconductor wafers to establish a p-n junction therein;
(b) forming front and back contacts on said wafers by metallization, said back contact material being chosen so that it penetrates any p-n junction present and forms a low resistance ohmic contact through any such junction;
(c) coin stacking said contact containing wafers;
(d) plasma etching the edge faces of said coin stacked wafers to remove sufficient p-n junction from said edge faces to electrically isolate said front p-n junction and
(e) separating the stacked wafers into individual wafers.

4,158,592
DISSOLUTION OF METALS UTILIZING A H_2O_2-SULFURIC ACID SOLUTION CATALYZED WITH KETONE COMPOUNDS

Philip D. Readio, Sparta, and John L. H. Allan, Glen Rock, both of N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Nov. 8, 1977, Ser. No. 849,573
Int. Cl.[2] C09K *13/06;* C23F *1/00*
U.S. Cl. 156—666 23 Claims

1. A method of metal dissolution which comprises contacting a metal with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide and an effective amount of a ketone additive soluble in the solution, which additive is selected from the group consisting of:
(a) unsubstituted or substituted monoalkanones selected from acetone, methyl ethyl ketone, diethyl ketone, methyl propyl ketone, diisopropyl ketone, methyl isobutyl ketone and diisobutyl ketone;
(b) cyclic monoalkanones selected from cyclopentanone and cyclohexanone, and
(c) 2,3-butanedione.

13. A composition for metal dissolution comprising an aqueous solution of from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide and an effective amount of a ketone additive soluble in the solution, which additive is selected from the group consisting of:
(a) unsubstituted or substituted monoalkanones selected from acetone, methyl ethyl ketone, diethyl ketone, methyl propyl ketone, diisopropyl ketone, methyl isobutyl ketone and diisobutyl ketone;
(b) cyclic monoalkanones selected from cyclopentanone and cyclohexanone, and
(c) 2,3-butanedione.

4,158,593
DISSOLUTION OF METALS UTILIZING A H_2O_2-SULFURIC ACID SOLUTION CATALYZED WITH SELENIUM COMPOUNDS

John L. H. Allan, Glen Rock, and Philip D. Readio, Sparta, both of N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Nov. 8, 1977, Ser. No. 849,576
Int. Cl.[2] C09K *13/06;* C23F *1/00*
U.S. Cl. 156—666 29 Claims

1. A method of metal dissolution without undesired scale formation which comprises contacting a metal with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide, a catalytically effective amount of an inorganic additive selected from selenium compounds in the +4 oxidation state, and at least 0.02 gram moles per liter of a secondary or tertiary alcohol selected from the group consisting of isopropyl alcohol, t-butyl alcohol, t-amyl alcohol and secondary or tertiary alcohols containing at least two hydroxyl groups.

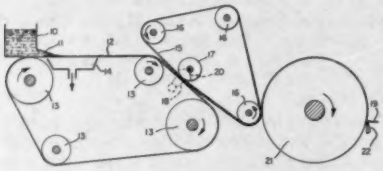
7. The method of claim 1, wherein the aqueous solution contains sodium phenolsulfonate as a stabilizer to reduce the degrading effect of heavy metal ions on hydrogen peroxide.

4,158,594

BONDED, DIFFERENTIALLY CREPED, FIBROUS WEBS AND METHOD AND APPARATUS FOR MAKING SAME

Henry E. Becker, Media; Albert L. McConnell, Wallingford, and Richard W. Schutte, Newtown Square, all of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 27,743, Apr. 13, 1970, abandoned. This application Jun. 24, 1971, Ser. No. 156,327
Int. Cl.[2] B31F 1/12
U.S. Cl. 162—112 51 Claims



1. A method of forming a strong, soft, fibrous sheet material having substantial stretch in all directions in its own plane, comprising:

forming a web predominantly of cellulosic fibers having a length of less than ¼ inch to have a basis weight of from about 5 to about 55 lbs. per ream of 2880 square feet,

applying a bonding material to one surface of said web in a quantity to result in said sheet material having at least about 1.4% non-volatile constituents of bonding material based on the dry web weight of said sheet material, and in a fine pattern which leaves a substantial portion of said surface of said web free from said bonding material, to form bonded portions in said sheet material in which fibers are bonded together by said bonding material to contribute to the strength of said sheet material,

adhering with said bonding material said bonded portions to a creping surface, and

differentially creping said web from said creping surface to form said sheet material.

4,158,595

PREPARATION OF HYDROPHILIC STYRENE MALEIC ANHYDRIDE COPOLYMER FIBERS FOR USE IN PAPERMAKING

Terence W. Rave, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jul. 27, 1977, Ser. No. 819,427
The portion of the term of this patent subsequent to May 15, 1996, has been disclaimed.
Int. Cl.[2] D21H 5/12
U.S. Cl. 162—157 R 11 Claims

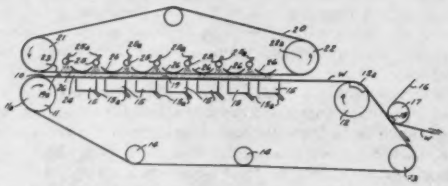
1. A process for the preparation of a fibrous pulp containing hydrophilic synthetic polymer fibers which comprises stirring a suspension of the fibers of a spurted fibrous styrene-maleic anhydride copolymer composition in a dilute aqueous admixture of water-soluble nitrogen-containing cationic and anionic polymers, said cationic polymer being (a) the reaction product of ammonia or a lower alkyl amine and an epichlorohydrin-modified aminopolyamide derived from a dicarboxylic acid and a polyalkylene polyamine having two primary amine groups and at least one secondary or tertiary amine group, or (b) the reaction product of epichlorohydrin and a condensate of cyanamide or dicyandiamide with a polyalkylene polyamine having the formula $H_2N(C_nH_{2n}NH)_xH$, wherein n is an integer 2 through 8 and x is an integer 2 or more, or (c) a poly(diallyldialkylammonium chloride) or (d) a poly(acrylate or methacrylate alkyl ester containing quaternary ammonium groups), and said anionic polymer being the reaction product of glyoxal and (a) a polyacrylamide containing from about 2 to about 15% acrylic acid units or (b) a partially hydrolyzed, branched poly(β-alanine) containing from about 1 to about 10 mole percent carboxyl groups based on amide repeating units, the ratio of said cationic polymer to said anionic polymer in said admixture of said polymers being in the range of from about 3:1 to about 1:5 by weight and the amount of said admixture of said polymers deposited on the fibers of said fibrous composition being from about one to about 15% by weight based on said fibrous composition.

4,158,596

TRAVELING WIRE WEB FORMER

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Jun. 8, 1977, Ser. No. 804,512
Int. Cl.[2] D21F 9/02
U.S. Cl. 162—213 14 Claims



1. An apparatus for forming a continuous web from a slurry of fiber containing stock comprising in combination:

an open porous looped traveling fourdrinier wire for traveling along a web forming path;

dewatering devices beneath the wire arranged along said path;

a looped distribution wire positioned to travel above said fourdrinier wire in parallel close running spaced relation thereto along said forming path in the same direction and substantially at the same speed having openings larger than the fourdrinier wire so that the fibers of the slurry pass therethrough and are carried forwardly at the speed of the fourdrinier wire and are random oriented so that the random orientation is not disturbed by the fiber being deposited on the moving fourdrinier wire;

stock delivery means positioned above and within the distribution wire for delivery of stock uniformly across and onto the distribution wire;

and forcing means above and within the distribution wire and separate from the stock delivery means forcing stock into the distribution wire to be carried therewith at the speed of the distribution wire and through the wire.

12. The method of continuously forming a web from a slurry of fiber containing stock in a mechanism having a continuously moving traveling fourdrinier wire traveling along a web forming path, means collecting water beneath the wire removed from a slurry on the wire surface, the method comprising;

uniformly distributing a supply of fiber containing slurry onto the traveling wire by passing an upper wire parallel to the fourdrinier wire but out of contact therewith at the speed of the fourdrinier wire;

distributing stock across the upper wire at locations spaced apart in a downstream direction;

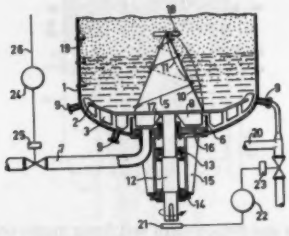
and forcing the distributed stock onto the upper wire by means separate from the means that distributes the stock so that the stock passes through the upper wire onto the fourdrinier wire and travels at the speed of the upper wire and the fourdrinier wire.

4,158,597

BLEACHING TOWER FOR GAS PHASE BLEACHING

Bengt E. Pettersson, Sundsvall, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

Continuation of Ser. No. 426,437, Dec. 20, 1973, Pat. No. 4,085,002. This application Feb. 1, 1978, Ser. No. 874,246
Claims priority, application Sweden, Jan. 15, 1973, 7300147
The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.
Int. Cl.[2] D21C *7/08, 7/12, 9/10*
U.S. Cl. 162—238 11 Claims



1. In a bleaching tower for gas-phase bleaching at high consistency of finely disintegrated gas-pervious fibrous material, said bleaching tower being substantially vertical and providing in the upper portion thereof a gas zone with an inlet for the fibrous material above a space for a column of fibrous material of high consistency, said column space overlying a dilution shape in the lower portion of the tower with supply conduits for dilution liquid and a discharge outlet for treated fibrous material, there being a mixing space between said column and said dilution space, the improvement which comprises:

inlet means for the dilution liquid being located in the wall of the tower close to the bottom thereof;

a hub body located centrally at the bottom of the tower on a shaft;

a driving means for rotation of said shaft, said hub body having an upwardly narrowing cross-section and a base diameter which is at least a fourth of the diameter of the tower at the level of the hub body, said hub body extending upwards at least somewhat into the mixing space and being provided with means for both guiding the material downwards and causing an additional torque to the torque required for rotating the hub body,

means for stirring and conveying the material to a discharge outlet located in the bottom of the tower;

a transmitter connected to the drawing means for the hub body shaft, said transmitter controlling the supply of dilution liquid to said dilution space in relation to the torque by means of a valve means in order to keep the height of the dilution space constant; and

means arranged to maintain the height of a column of fibrous material in said tower.

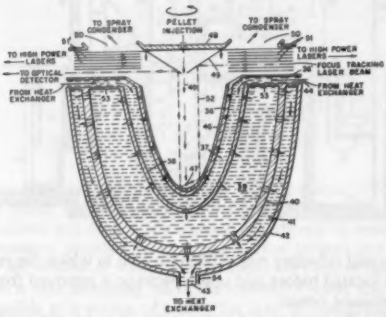
4,158,598

PARABOLIC LITHIUM MIRROR FOR A LASER-DRIVEN HOT PLASMA PRODUCING DEVICE

James K. Baird, Clinton, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 570,311, Apr. 21, 1975, abandoned. This application Jun. 14, 1976, Ser. No. 695,661
Int. Cl.[2] G21B *1/00*
U.S. Cl. 176—1 2 Claims

1. A device for producing a hot plasma comprising a pressure vessel provided with an outer housing and an inner apertured liner in the shape of a paraboloid; at least two additional apertured walls positioned between said liner and said outer housing, all of said walls and said liner being in respective spaced relation to define respective nested chambers therebetween, means for feeding liquid lithium into said vessel within said liner; means coupled to said vessel for rotating it at a desired speed thereby creating a void area in the liquid lithium such that the free liquid mirror-like surface of said lithium forms a paraboloid of revolution having an axis of symmetry coaxial with the axis of rotation of said pressure vessel; a bottom outlet provided in said vessel and coupled between one of said chambers and said lithium feeding means; an inverted conical mirror with a half-angle of 45° provided with a hole at its apex and positioned above said void area; a plurality of pulsed lasers positioned in such a manner as to provide a plurality of respective pulsed laser beams directed in paths perpendicular to and toward said axis of symmetry and toward the surface of said conical mirror, said mirror redirecting said beams in respective parallel paths with respect to said axis of symmetry, said redirected laser beams being reflected and



focused by said lithium mirror-like surface to a common focal point of said paraboloid; a fuel pellet injection means positioned above said mirror and void area; and a plurality of fuel pellets adapted to be sequentially injected by said injection means through said hole in said mirror apex to said paraboloid focal point in timed sequence such that each pellet reaches said focal point at the same time as all of said pulsed laser beams arrive at said focal point; said liner being provided with a plurality of partitions sub-dividing the free liquid surface of said paraboloid of revolution of said liquid lithium; and the top of said pressure vessel being provided with an opening which is adapted to be connected to a spray condenser, whereby each of said sequentially injected fuel pellets is compressed and imploded by said plurality of pulsed laser beams to thus provide a substantially hot plasma and the consequent production of neutrons and x-rays.

4,158,599

METHOD OF REFUELING REACTOR

Harry N. Andrews, Export, Pa., and Richard S. Orr, Jacksonville, Fla., Robert J. French, Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 310,725, Nov. 30, 1972, abandoned, which is a continuation of Ser. No. 53,202, Jul. 8, 1970, abandoned. This application Feb. 10, 1976, Ser. No. 656,914
Int. Cl.[2] G21C *19/02*
U.S. Cl. 176—30 2 Claims

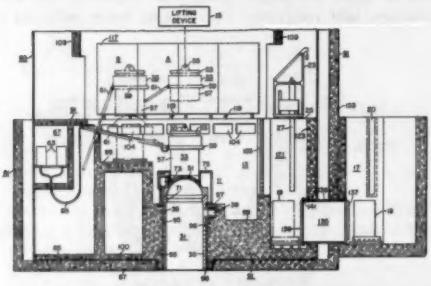
1. The method of refueling, in a relatively short time interval, a nuclear reactor having a pressure vessel, a core therein having fuel assemblies to be replaced; fuel in said fuel assemblies having an enrichment of about 2.7% to 3.2% in fissionable material, an upper package including the head of the pressure vessel, control rods and control rod drive mechanisms and housings, electrical cables connected at one end to said control rod drive mechanisms and adapted for connection at their other ends to a power source, a lifting device and said head being held to said vessel by studs having stud tensioners and

detensioning means for detensioning said studs, the said method comprising the steps of:

increasing the concentration of neutron absorbing material to its refueling magnitude in coolant circulated through the core, said refueling magnitude being that amount and concentration of neutron absorbing material which corresponds to the fissionable material enrichment in the fuel assemblies and which is needed to compensate for neutron activity upon withdrawal of control rods from the core;

actuating said detensioning means to unlock and remove said studs thereby unlocking said head from said vessel,

lifting said upper package in a single lifting operation to a prepared position away from said pressure vessel thus affording access to said core, flooding borated water equal



to said refueling magnitude into a pit in which the reactor is located before said upper package is removed from the pressure vessel;

raising the level of said water in the pit to a point just below the stud detensioners and cables, and then maintaining said level by uniformly increasing the level of said water in the pit during the time of lifting said upper package from the pressure vessel; and

by virtue of such access replacing said fuel assemblies in said core at relatively short intervals by replacing about ten percent of the spent fuel assemblies when the reactor is refueled at three month intervals; and replacing about twenty percent of the spent fuel assemblies when the reactor is refueled at six month intervals.

4,158,600

APPARATUS FOR HANDLING CONTROL ROD DRIVES

Seiichi Akimoto; Mitsuhiro Watanabe; Tomiharu Yoshida, all of Hitachi; Zunichi Sugaya, Katsuta; Takashi Saito, and Yoshimi Ishii, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 16, 1977, Ser. No. 778,168
Claims priority, application Japan, Mar. 19, 1976, 51-29106
Int. Cl.[2] G21C *19/20*
U.S. Cl. 176—30 **39 Claims**

8. Apparatus for handling control rod drives (hereinafter referred to as CRD's) attached by detachable fixing means to housing mounted in a reactor pressure vessel and each coupled to one of control rods inserted in the reactor pressure vessel, comprising in combination:

cylindrical housing means;

uncoupling means mounted in the housing means for uncoupling each of said control rods from one of said CRD's;

means mounted on the housing means for effecting attaching and detaching of said fixing means;

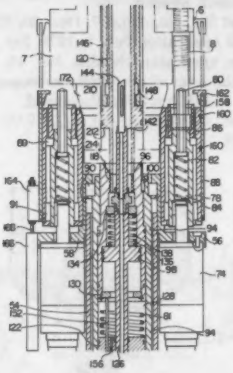
means for supporting said housing means;

means for moving the support means longitudinally of the CRD;

means for preventing scattering of coolant flowing out of each of said CRD housings when said fixing means is detached;

drain means for discharging the released coolant to a predetermined position; and

wherein each of said CRD's is fixed to one of said CRD housings by means of a plurality of bolts, and said means for effect-



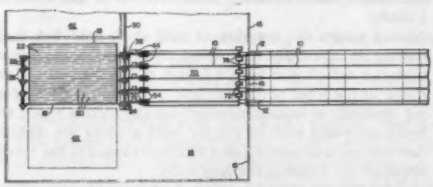
ing attaching and detaching of said fixing means comprises bolt wrench assemblies equal in number to said bolts.

4,158,601

NUCLEAR FUEL PELLET LOADING APPARATUS

Kenneth S. Gerkey, Mount Lebanon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 12, 1977, Ser. No. 796,244
Int. Cl.[2] G21C *19/20;* **B66C** *17/08*
U.S. Cl. 176—30 **6 Claims**



1. Apparatus for loading a predetermined amount of nuclear fuel pellets into nuclear fuel elements comprising:

a gas-tight housing having a sealing mechanism in the side thereof for accommodating the insertion of the open end of said fuel elements in a gas-tight manner;

rows of nuclear fuel pellets disposed in colinear alignment with said open ends of said fuel elements for being loaded into said fuel elements;

a drive shaft extending through said housing above and transverse to said rows of nuclear fuel pellets and being attached to a motor located outside said housing for providing a mechanism to load said fuel pellets; and

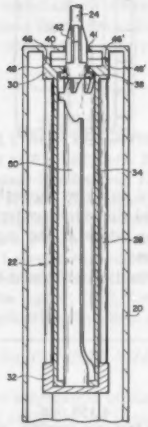
a first gear disposed on said drive shaft, a second gear disposed on an axle arranged parallel to said drive shaft and above said rows of fuel pellets, a continuous drive line extending around said first gear and said second gear while being arranged substantially parallel to said rows of fuel pellets, and a dog pivotally attached to said drive line and extending downwardly into a position to contact said fuel pellets when said drive line is activated, said drive shaft being capable of rotating said first gear causing said drive line to move around said second gear thereby causing said dog to contact said fuel pellets, thus causing said fuel pellets to advance toward said fuel elements.

4,158,602

METHOD AND APPARATUS FOR CONTROLLING THE NEUTRON FLUX IN NUCLEAR REACTORS

Lawrence E. Minnick, Los Altos Hills, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jan. 27, 1977, Ser. No. 762,972
Int. Cl.[2] G21C 7/08
U.S. Cl. 176—36 R 22 Claims



4. In a nuclear reactor of the type cooled by a flow of coolant and having controls rods that are mounted for movement with respect to the fuel elements in the core, the improvement comprising:

(a) a control rod in a control rod housing in a nuclear reactor, said control rod having a sealing surface and insertable into the high neutron flux region of the reactor independently from external actuation;

(b) a supporting drive shaft connected to the control rod for moving the control rod with respect to the fuel elements; and

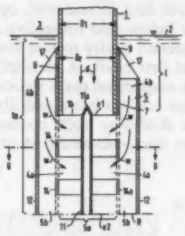
(c) a stationary separator plate forming a top wall of the control rod housing and directly and concurrently exposed to the pressure of coolant flowing past the fuel elements in the nuclear reactor and having an orifice across which a differential pressure is developed by the flow of coolant through the reactor, said separator plate also having a sealing surface around said orifice which complements the sealing surface of the control rod, the sealing surfaces on the control rod nd separator plate can be retained together by the differential pressure developed by the coolant flow, said separator plate being positioned within the reactor so that a reduction in the flow of coolant past the fuel elements causes, in direct response thereto, a corresponding reduction of the differential pressure across the separator plate, release of the sealing surfaces on the control rod and the separator plate, and the entry of the control rod into the high neutron flux region of the reactor substantially simultaneously with the reduction in flow.

4,158,603

BLOW-OFF DEVICE FOR LIMITING EXCESS PRESSURE IN NUCLEAR POWER PLANTS, ESPECIALLY IN BOILING-WATER NUCLEAR POWER PLANTS

Roland Kühnel, Dietzenbach, Fed. Rep. of Germany, assignor to Kraftwek Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Mar. 7, 1977, Ser. No. 774,945
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1976, 2609571
Int. Cl.[2] G21C 9/00
U.S. Cl. 176—38 6 Claims



1. In a blow-off device for limiting excess pressure in nuclear power plants, at least one condensation tube disposed so that a lower outlet end thereof is immersed in a volume of water in a condensation chamber having a gas cushion located in a space above the volume of water, and the upper inlet end of the condensation tube extending out of the volume of water and being connectible to a source of steam that is to be condensed or a steam-air mixture, the outlet end of the condensation tube, for smoothing the condensation, being provided with wall parts forming passages extending in axial direction, delimited from one another and terminating in the water volume, said wall parts serving to subdivide steam flow from the source thereof and bubbles produced thereby in the water volume, said wall parts being constructed as a tube attachment and being formed with an opening corresponding to said outlet end of said condensation tube and by means of which said tube attachment is mounted on said outlet end of said condensation tube, a first group of said wall parts in said tube attachment being disposed in alignment with said outlet end of said condensation tube, and a second group of said wall parts surrounding said first group thereof, the passages formed by said second group of said wall parts communicating laterally with the passages formed by said first group of said wall parts, the passages formed by said second group of said wall parts, at least at the upper ends thereof, communicating with the water volume, said first and said second groups of wall parts being formed of axially and radially extending plates defining sector-shaped passage cross sections.

4,158,604

BOILER SYSTEMS FOR NUCLEAR POWERED REACTORS

Reginald K. Cook, Kibworth Harcourt, and Brian V. George, Willoughby Waterleys, both of England, assignors to Nuclear Power Company (Whetstone) Limited, Leicestershire, England

Continuation of Ser. No. 178,525, Aug. 30, 1971, abandoned.
This application Aug. 7, 1974, Ser. No. 496,285
The portion of the term of this patent subsequent to Mar. 19, 1994, has been disclaimed.
Int. Cl.[2] G21C 15/02
U.S. Cl. 176—60 5 Claims

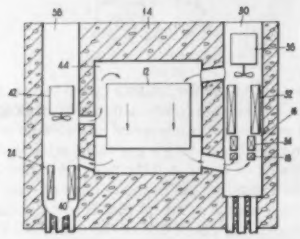
1. Power generating plant comprising: a gas-cooled nuclear reactor having a reactor core, a concrete pressure vessel housing the core and defining above and below the core, respectively, an upper and a lower coolant-gas plenum space, the

pressure vessel having a vertical wall surrounding the core and having formed in said wall a plurality of vertically extending first cavities and a plurality of vertically extending second cavities; a plurality of main steam turbines each having a high pressure stage and a lower-pressure stage; a plurality of further steam turbines, each of lower capacity than any of said main steam turbines; a respective first duct, in said wall, opening out of each said first cavity and connecting it to said upper plenum space; a respective second duct, in said wall, opening into said first cavity below said respective first duct and connecting said first cavity to said lower plenum space;

a respective third duct, in said wall, opening out of each said second cavity and connecting it to said upper plenum space;

a respective fourth duct, in said wall, opening into each said second cavity below said respective third duct and connecting said second cavity to said lower plenum space;

within each said first cavity a respective main boiler and, thereabove, a respective main gas-circulating means arranged to draw coolant gas upwardly through said main boiler and to discharge such coolant gas through said respective first duct into said first plenum chamber, said



respective main boiler having an upper economizer and evaporator section and, therebelow, a lower superheater section connected to supply steam to said high-pressure stage of a respective one of said main steam turbines; within each said first cavity, and below said respective main boiler therein, a respective steam reheater connected to receive steam from that main turbine high-pressure stage supplied by said respective main boiler and to supply said steam to the lower-pressure stage of that main turbine; and within each said second cavity, a respective further duct extending longitudinally thereof both above and below said respective fourth duct opening into said second cavity, a respective further gas circulating means arranged to draw coolant gas upwardly through said respective third duct into said first plenum chamber, and a respective further boiler disposed externally of said respective further duct above the lower end thereof and below said respective fourth duct opening into said respective second cavity, each said further boiler being of lower capacity than any of said main boilers and being connected to supply steam to a respective one of said further steam turbines.

4,158,605

NUCLEAR CORE BAFFLING APPARATUS

Frank W. Cooper, Jr., Monroeville; Bernard L. Silverblatt, Pittsburgh, both of Pa.; Charles B. Knight, and Robert T. Berringer, both of Gulf Breeze, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 25, 1975, Ser. No. 635,023

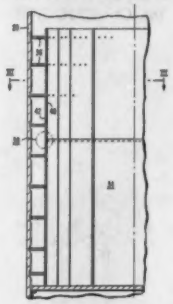
Int. Cl.[2] G21C *9/00*

U.S. Cl. 176—61 **11 Claims**

1. Apparatus for baffling flow into and about the core of a nuclear reactor comprising:

(a) a structure spaced from and surrounding the radial periphery of said core,

(b) a plurality of baffle plates disposed between said structure and said core, said plates being positioned closely adjacent the radial periphery of said core so as to approach the outer configuration of said core and being longitudinally aligned atop one another so as to present a



substantial barrier to flow through said longitudinally aligned plates, said aligned plates further having cooperative interengaging edges at the region of alignment to form lap joints, and

(c) means to fasten said plates to said structure.

4,158,606

AUSTENITIC STAINLESS STEEL ALLOYS HAVING IMPROVED RESISTANCE TO FAST NEUTRON-INDUCED SWELLING

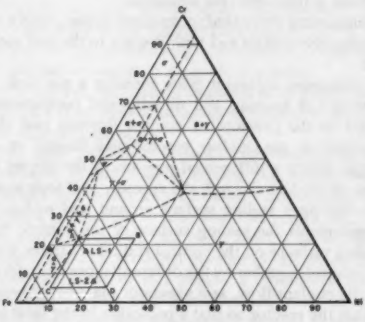
Everett E. Bloom; James O. Stiegler; Arthur F. Rowcliffe, all of Oak Ridge, and James M. Leitnaker, Kingston, all of Tenn., assignors to The United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 763,268, Jan. 27, 1977, abandoned, which is a division of Ser. No. 596,546, Jul. 16, 1975, Pat. No. 4,011,133. This application Mar. 15, 1978, Ser. No. 886,867

The portion of the term of this patent subsequent to Mar. 8, 1994, has been disclaimed.

Int. Cl.[2] G21C *1/00*

U.S. Cl. 176—87 **8 Claims**



1. In a nuclear reactor having a structural component made of austenitic stainless exposed to fast neutron flux swelling conditions, the improvement wherein said austenitic stainless steel consists essentially of Fe, Cr and Ni and prescribed within the area ABCD in the ternary diagram of FIG. 3, and a void depressing concentration of Si and Ti.

4,158,607

ENZYMATIC PREPARATION FOR RIPENING OF MILK PROTEIN PRODUCTS

Leonard Kalinowski; Elżbieta Frackiewicz; Leonarda Janiszewska; Anna Pawlik; Danuta Kikolska, all of Warsaw; Jerzy Pisarek, Pruszków; Maria Azadkowska, and Jadwiga Świtacz-Tomaszewska, both of Warsaw, all of Poland, assignors to Instytut Przemyslu Mleczarskiego, Warsaw, Poland

Filed Oct. 4, 1977, Ser. No. 839,507

Claims priority, application Poland, Oct. 19, 1976, 193146

Int. Cl.[2] C07G *7/02;* A23C *19/02*

U.S. Cl. 195—62 **2 Claims**

1. An enzymatic preparation for ripening of milk protein products, consisting essentially of a mixture of purified intracellular fungal protease from *Penicillium candidum* and of proteolytic enzymes obtained by autolysis of lactic acid bacteria cells.

4,158,608

FUNGICIDALLY ACTIVE ANTIBIOTIC FROM *STREPTOMYCES TENDAE* ETTLINGER

Ursula Dähn, Filderstadt-Bernhausen; Hanspaul Hagenmaier, Tuebingen; Helmut Höhne, Bad Soden; Wilfried König, Pinneberg; Hans Scheinpflug, Leverkusen, and Hans Zähner, Tuebingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 669,780, Mar. 24, 1976, Pat. No. 4,046,881. This application Apr. 7, 1977, Ser. No. 785,729

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1975, 2537028

Int. Cl.[2] C12D *9/14*

U.S. Cl. 195—80 R **2 Claims**

1. A process for the preparation of the antibiotic Nikkomycin which comprising culturing the strain *Streptomyces tendae* Ettlinger et al Tu 901 in an aqueous nutrient medium containing a source of carbon, nitrogen, hydrogen and oxygen under aerobic conditions at about 18° to 37° C. and at a pH of about 5.5 to 8 and isolating Nikkomycin from the culture.

4,158,609

PROCESS FOR THE CONTINUOUS CONVERSION OF PRODUCTS BY ENZYME ACTION

Hans Müller, Im Allmendli, 8703 Erlenbach, Switzerland

Continuation of Ser. No. 723,882, Sep. 19, 1976, abandoned. This application Dec. 29, 1977, Ser. No. 865,621

Claims priority, application Switzerland, Sep. 23, 1975, 12350/75

Int. Cl.[2] C12B *1/00*

U.S. Cl. 195—115 **3 Claims**

1. A process for the continuous conversion of products by enzyme action comprising the steps of:

(a) continuously passing a substrate and an enzyme containing solution through a plurality of series-connected reaction zones in which the substrate is subjected to a conversion reaction by enzymes;

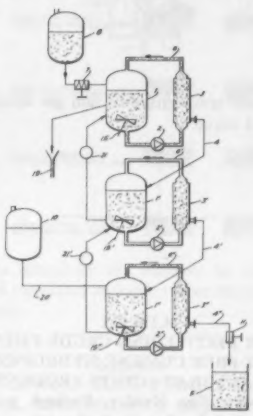
(b) continuously passing the conversion product from each reaction zone through an ultrafiltration zone for separation of the enzyme as the retentate from said product before passing the product on to the next reaction zone;

(c) continuously recycling enzyme remaining as the said retentate in each filtration zone back into the reaction zone from which product is fed into said ultrafiltration zone, and

(d) continuously collecting the converted product received as the filtrate from the last of said plurality of series-connected filtration zones while passing back partly spent enzyme from each reaction zone to the next preceding reaction zone,

the said reaction zones and filtration zones forming a closed circulation circuit and fresh substrate being continuously passed into the first of said reaction zones, fresh enzyme being continuously passed into the last of said reaction zones and causing a countercurrent flow in each reaction zone between the substrate and the enzyme supply.

3. An apparatus for the continuous production of products by enzymatic action comprising a plurality of reaction tanks connected in series; a supply tank for a substrate; a conduit connecting said supply tank with the first reaction tank in the series; an ultrafilter adapted to separate an enzyme from its reaction product associated with each reaction tank, wherein each of said ultra filters being provided with an inlet, an outlet for removal of retentate and an outlet for removal of filtrate; separate conduits leading from each reaction tank to the inlet of ultrafilter and leading from the outlet of each ultrafilter back



into each reaction tank, the said conduits forming a closed circuit system between each reaction tank and ultrafilter; a duct connecting the respective filtrate removal outlet with the next reaction tank; a discharge outlet for the filtrate of the last ultrafilter; means for collecting the product received from said discharge outlet; conduits connecting each reaction tank with each preceding reaction tank; pump means for recirculating partly spent enzymes through said conduits and tanks; a supply tank for fresh enzyme connected to the last reaction tank so as to cause the fresh enzyme and the partly spent enzyme to move through said reaction tanks in countercurrent to the product formed in said reaction tanks.

4,158,610

METHOD AND APPARATUS FOR DETERMINING AND CONTROLLING AMOUNT OF CARBON DEPOSITED ON A SURFACE BY A GAS

Edmund G. Bauer, Allentown, and Glenn E. Shadle, Center Valley, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Mar. 28, 1978, Ser. No. 890,890

Int. Cl.[2] C10B *57/18;* G01N *27/04;* H01C *1/00*

U.S. Cl. 201—1 **3 Claims**

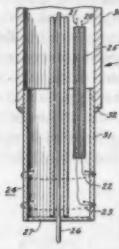
2. A method for controlling the effective thickness of a layer of carbon deposited on a surface by a gas carrying entrained particles of carbon and by thermal cracking of said gas comprising the steps of:

(a) providing a probe which is a cylinder having an outer surface characterized by extremely high resistivity and having spaced apart first and second wires therearound connected to an electric circuit,

(b) positioning said probe with said cylinder being disposed in the path of the flow of said gas with its axis perpendicular to the direction of flow of said gas,

(c) providing means in said electric circuit for plotting a curve of the resistance between the first and second wires as a function of time,

(d) providing means for recording the temperature of said gas as a function of time, and



(e) adjusting the temperature of said gas according to the slope of said curve.

4,158,611

PROCESS FOR RECOVERING CRUDE PHENOL FROM CATALYST-FREE CUMENE HYDROPEROXIDE CLEAVAGE REACTION PRODUCTS

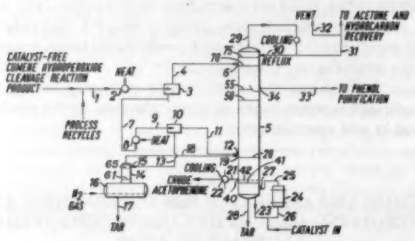
Maurice D. Cooke, East Horsley, England, assignor to BP Chemicals Limited, London, England

Filed Dec. 15, 1977, Ser. No. 860,859

Claims priority, application United Kingdom, Dec. 18, 1976, 48075/76

Int. Cl.[2] B01D *3/00*; C07C *37/38*

U.S. Cl. 203—28 **13 Claims**



1. A process for recovering crude phenol from catalyst-free cumene hydroperoxide cleavage reaction product which process comprises continuously feeding said reaction product to an intermediate point in a distillation column provided with conventional reboiler, condensing and refluxing facilities, separating in the upper section of said distillation column phenol from a fraction containing materials having a boiling point lower than phenol, including acetone, said fraction being removed as an overhead fraction from the head of said upper section, and in the lower section of said distillation column separating crude phenol from a fraction containing materials of higher boiling point than phenol, including acetophenone and carbinol, said crude phenol being removed as a sidestream fraction from said column at a point in said column above said feed-point wherein the total concentration of acetophenone plus carbinol in said crude phenol is reduced by fractionation to less than 1000 ppm (weight), and removing at the base of said column a fraction containing acetophenone, carbinol, phenol and higher boiling compounds.

4,158,612

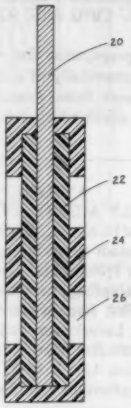
POLYMERIC MANDREL FOR ELECTROFORMING AND METHOD OF ELECTROFORMING

Daniel Luch, Warwick, N.Y., and John E. Chart, Edinboro, Pa., assignors to The International Nickel Company, Inc., Suffern, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,274

Int. Cl.[2] C25C *7/02*; C25D *17/12*

U.S. Cl. 204—12 **6 Claims**



1. A mandrel for electroforming metal comprising:

a. a thin metal core having a laminar configuration with an extended surface area;

b. at least one electrically conductive polymer layer resistant to an electroplating electrolyte in contact with and enclosing at least a portion of said metal core; and

c. at least one non-conductive polymer layer resistant to an electroplating electrolyte molecularly bonded across said extended surface area to said electrically conductive polymer layer and surrounding said electrically conductive polymer layer and said metal core, said non-conductive polymer layer having a pattern of a multiplicity of open areas corresponding to the size and shape of a desired cathode product such that the said open areas expose a pattern of conductive areas on said electrically conductive polymer layer.

4,158,613

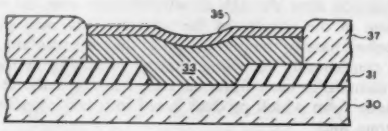
METHOD OF FORMING A METAL INTERCONNECT STRUCTURE FOR INTEGRATED CIRCUITS

Marilyn R. Sogo, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 4, 1978, Ser. No. 966,326

Int. Cl.[2] C25D *5/02*; H01L *23/48*

U.S. Cl. 204—15 **10 Claims**



1. A method of forming an interconnect structure on a semiconductor substrate, said method comprising:

depositing an aluminum layer on said substrate;

depositing a layer of a refractory metal on said aluminum layer, said refractory metal being selected from the group of tantalum, hafnium and niobium;

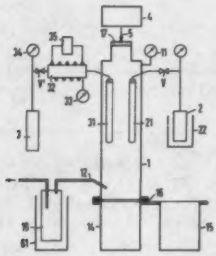
defining the interconnect structure on said refractory metal with a photoresist pattern;

etching the exposed refractory metal to expose portions of said aluminum layer;
removing said photoresist pattern;
anodizing said exposed aluminum and said exposed refractory metal such that said exposed aluminum layer is completely anodized while only a thin layer of said refractory metal is anodized; and
removing the thin layer of anodized refractory metal.

4,158,614
METHOD FOR SEPARATING GASEOUS MIXTURES OF MATTER

Eberhard Schuster, and Arno Kersting, both of Erlangen, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Continuation of Ser. No. 573,071, Apr. 30, 1975, abandoned. This application Apr. 14, 1977, Ser. No. 787,444
Int. Cl.[2] B01J 1/10
U.S. Cl. 204—157.1 R **7 Claims**



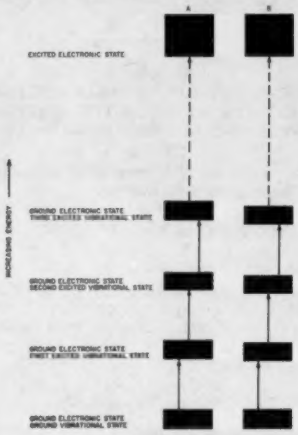
1. A method for chemically separating isotopes from a mixture of gaseous matter formed by mixed isotopes and a chemical reaction partner, by a reaction directed by a light beam projected through the mixture with the light beam having a narrow band of wave lengths molecularly exciting mainly the isotope to be separated and thereby promoting its reaction with the reaction partner, wherein the improvement comprises supplying the reaction partner with addition energy to a degree substantially reducing the energy of the light beam required to promote said reaction in the absence of the addition of the energy to the reaction partner.

4,158,615
ISOTOPE SEPARATION PROCESS

Richard K. Lyon, Fanwood, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 612,707, Sep. 12, 1975, abandoned. This application May 11, 1977, Ser. No. 796,031
Int. Cl.[2] B01J 1/10
U.S. Cl. 204—157.1 R **8 Claims**

1. A method of separating the isotopes of an element, said method being applied to a gaseous compounds of said element, said gaseous compound having an absorption band with P, Q and R branches corresponding to the atom whose isotopes are being separated, the shift in wavelength of said absorption band for molecules of one isotopic form with respect to the same absorption band for molecules of the other isotopic form or forms being sufficiently small so that the absorption bands overlap and there exists a range of wavelengths in which said molecules in all isotopic forms absorb radiation within the P branch portion of said absorption band, such that at all wavelengths wherein one isotopic form absorbs radiation so does the other to a substantial degree, said method comprising subjecting molecules of said compound to radiation from an IR laser at or about a predetermined wavelength at a power density of at least 10^4 watts per cm^2 per torr total pressure, said radiation having an effective bandwidth considering power broadening of more than 0.1 cm^{-1}, and being within the wavelength range corresponding to said P branch whereby the molecules containing the lighter isotope or isotopes are preferentially excited and absorb more than 1 quanta of IR radiation, preferentially converting the excited molecules by any means



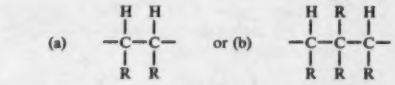
whose rate or selectivity are sensitive to temperature and separating said converted molecules from the molecules which are unconverted.

4,158,616
URANIUM OXIDE PRODUCTION

David L. Tomaja, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 25, 1978, Ser. No. 872,133
Int. Cl.[2] B01J 1/10; B01D 11/04
U.S. Cl. 204—157.1 R **13 Claims**

1. A method for producing uranium oxide hydrate comprising irradiating a solution of a diluent selected from at least one of water, methanol, or ethanol; water-soluble uranium salt; carboxylate ion; and at least one crown ether selected from the group consisting of dicyclohexano-18-crown-6 and crown ether wherein the cyclic ring consists of from 4 to 10 —O—J— units wherein J for a particular crown ether is



wherein each R is independently selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms, or wherein at least one J is (b) and the remaining J's are (a), with light of photochemically active wavelength wherein said crown ether is present in an amount sufficient to promote the rate of uranium oxide hydrate production.

4,158,617
RADIATION CURED AND MONOMER MODIFIED SILICON ELASTOMERS

Roger J. Eldred, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 8, 1976, Ser. No. 664,662
Int. Cl.[2] C08F 283/12, 2/54
U.S. Cl. 204—159.13 **8 Claims**

1. An elastomer comprising the high energy electron beam radiation induced reaction product of a uniform mixture comprising about 100 parts by weight of a silicone elastomer selected from the group consisting of methyl vinyl silicone (VMQ) and phenyl vinyl methyl silicone (PVMQ), from about 2 to about 8 parts of a polyfunctional acrylic monomer selected

from the group consisting of trimethylolpropanetrimethacrylate and polyethylene glycol dimethacrylates and a filler, said monomer and filler being thoroughly blended prior to the preparation of said uniform mixture, said elastomer having a "cure factor" of less than 45.

4,158,618

ACTINIC-RADIATION CURABLE POLYMERS PREPARED FROM A REACTIVE POLYMER, HALOGENATED CYCLIC ANHYDRIDE AND GLYCIDYL ESTER

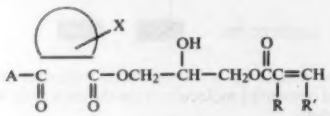
Stephen D. Pastor, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 655,755, Feb. 6, 1976, abandoned. This application Mar. 17, 1978, Ser. No. 887,760

Int. Cl.[2] **C08F** *8/00*

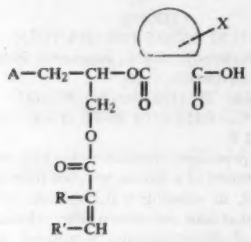
U.S. Cl. 204—159.16 **10 Claims**

1. A cured composition of matter prepared by exposing to actinic radiation of wavelength in the range of 2500 to 4000 A without the addition of externally added photoinitiator a composition which is insensitive to the effects of atmospheric oxygen of the formula:



(i)

or



(ii)

where A is a residue of a polymer having a molecular weight of about 500 to 5,000 and containing at least one reactive terminal hydroxyl or carboxyl group; X is at least one halogen selected from the group consisting of chlorine, bromine and iodine; and R and R' are independently methyl or hydrogen.

4,158,619

METHOD AND APPARATUS FOR REMOVING EXCESS ELECTRO-PHORETIC MATERIAL FROM A COATED INTERIOR WORKPIECE SURFACE

Loyd R. Brower, Jr., Olympia Fields; Leonard P. Madsen, St. Anne, and Chesley L. Zutaut, Park Forest, all of Ill., assignors to Standard T Chemical Company, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 807,965, Jun. 20, 1977, Pat. No. 4,107,016, which is a continuation of Ser. No. 686,110, Jun. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 597,314, Jul. 21, 1975, abandoned. This application Feb. 17, 1978, Ser. No. 878,682

Int. Cl.[2] **C25D** *13/14*

U.S. Cl. 204—181 R **17 Claims**

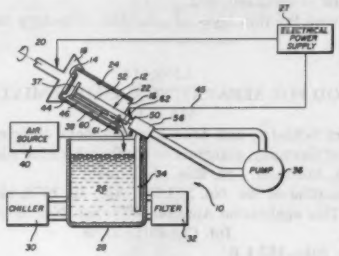
1. A method for electrophoretically coating the interior surface of an electrically conductive workpiece having a longitudinal axis and a longitudinal dimension and having a body portion closed at one end and open at the opposite end, said method comprising the steps of:

establishing the workpiece at one electrical polarity;

flowing an electrophoretic material in a linear stream along the longitudinal dimension of the workpiece;

inducing an electrical charge of opposite polarity on the electrophoretic material and along the length of the linear stream thereof to effect electrophoretic migration of the electrophoretic material to the workpiece;

moving the workpiece and the charged linear stream of electrophoretic material relative to one another about an axis corresponding to the longitudinal axis of the workpiece thereby to electrophoretically deposit a coating of the material over the entirety of the workpiece interior surface; and



providing a flow of air over the entirety of the electrophoretic coating to remove excess electrophoretic material therefrom.

4,158,620

RETORTING OIL SHALE WITH IRON OXIDE IMPREGNATED POROUS PELLETS

Steven R. Beck, Lubbock, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 8, 1977, Ser. No. 858,576

Int. Cl.[2] **C10G** *1/00;* **C10B** *49/00, 49/16*

U.S. Cl. 208—11 R **3 Claims**

1. In a method for retorting crushed oil shale containing carbonaceous organic matter and mineral matter wherein hot heat-carrying solids at retort zone inlet temperature are mixed with oil shale in a retort zone to produce gas and oil products and a mixture of said heat-carrying solids and spent shale solids and wherein heat-carrying solids are separated from spent shale solids in at least one separation stage, the improvement comprising:

a. feeding crushed oil shale and hot porous pellets to a retort zone, said hot porous pellets being at a retort zone inlet temperature of between 538° C. and 816° C. and in a quantity such that the sensible heat in said pellets is sufficient to provide at least fifty percent of the heat required to heat said crushed oil shale from its retort zone feed temperature to a retort zone outlet temperature of between 400° C. and 621° C., said pellets having a surface area of at least 10 square meters per gram, said pellets having an iron oxide material impregnated on said surface area, said iron oxide being originally comprised predominantly of two parts iron and three parts oxygen, said iron oxide being in sufficient quantity to make the magnetic attractability of said pellets significantly higher than the magnetic attractability of said spent shale solids at the operating conditions of said at least one separation stage;

b. retorting in said retort zone gas and oil products from said crushed oil shale, thereby forming a mixture of hot porous pellets and spent shale solids;

c. recovering said gas and oil products generated by retorting said crushed oil shale;

d. passing said mixture of said porous pellets and spent shale solids from said retort zone to a solids separation and recovery zone;

e. passing a mixture of said pellets and spent shale solids in said separation zone through said at least one separation stage, said separation stage being a magnetic separator; and

f. separating in said magnetic separation stage at least a portion of said pellets from said spent shale solids.

4,158,621

PROCESS FOR INCREASING GASOLINE YIELD AND QUALITY DURING CATALYTIC CRACKING OF HIGH METALS CONTENT CHARGE STOCKS USING AN ALUMINA-ALUMINUM PHOSPHATE-SILICA-ZEOLITE CATALYST

Harold E. Swift, Gibsonia; John J. Stanulonis, Pittsburgh, and Elizabeth H. Reynolds, Verona, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jul. 21, 1978, Ser. No. 926,886
Int. Cl.[2] C10G *11/02*; B01J *8/24, 27/18*
U.S. Cl. 208—114 **17 Claims**

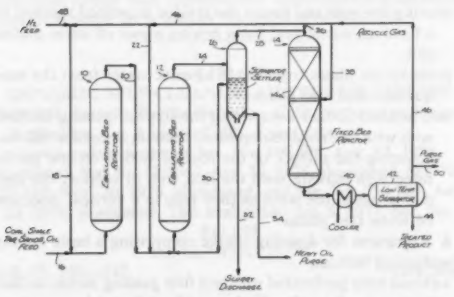
1. A process for increasing the gasoline yield and quality in a petroleum cracking reaction by contacting a hydrocarbon feedstock under catalytic cracking conditions with a catalyst comprising an alumina-aluminum phosphate-silica matrix characterized after calcination at 500° C. for 16 hours as amorphous, and having an average pore radius of from about 10° A to about 200° A; a surface area ranging from about 50 m^2/g to about 300 m^2/g; a pore volume of from about 0.1 cc/g to about 1.2 cc/g; and wherein the alumina-aluminum phosphate-silica matrix has a mole percent ratio of from about 15:80:5 to about 60:10:30 and wherein said matrix retains at least 70% of its surface area when the matrix is additionally calcined at a temperature up to about 900° C. for about 16 hours; said matrix being composited with from about 5 to about 50 weight percent of a REY-zeolite.

4,158,622

TREATMENT OF HYDROCARBONS BY HYDROGENATION AND FINES REMOVAL

Eugene F. Schwarzenbek, Lavalette, N.J., assignor to Cogas Development Company, Princeton, N.J.

Filed Feb. 8, 1978, Ser. No. 876,014
Int. Cl.[2] C10G *23/00*
U.S. Cl. 208—177 **17 Claims**



1. A method of treating hydrocarbonaceous material by hydrogenation to separate oxygen, sulfur and nitrogen and removal of fines, said method comprising the steps of

(a) partially hydrogenating said material by passing it through ebullating catalytic bed reactor means along with hydrogen gas while allowing vaporization of some of said material during the hydrogenation reaction, but retaining a sufficient amount of said material in liquid form as a liquid portion to carry the accompanying fines through the reactor means,

(b) separating the vapors from said liquid portion and accompanying fines transferred from said ebullating bed reactor means and subjecting said vapors to further hydrogenation,

(c) concentrating said fines into a part of said liquid portion in step (b) to form a slurry and ejecting said slurry from said liquid portion,

(d) subjecting another part of said liquid portion from step (b) to further hydrogenation.

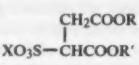
4,158,623

PROCESS FOR FROTH FLOTATION OF PHOSPHATE ORES

Samuel S. Wang, Cheshire, and Ernie F. Huliganga, Milford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 21, 1977, Ser. No. 863,029
Int. Cl.[2] B03D *1/02*
U.S. Cl. 209—166 **10 Claims**

1. A process for beneficiating phosphate ores which comprises sizing the ore to provide mineral values of flotation size, slurrying the sized ore in aqueous medium, conditioning the slurried ore with an effective amount of a combination collector adding fuel oil to control excessive frothing, and thereafter recovering the desired mineral values by froth flotation, said collector combination comprising from about 1 to about 99 weight percent of a fatty acid derived from a vegetable or animal oil and, correspondingly, from about 99 to about 1 weight percent of a dialkyl sulfosuccinic acid or the salt thereof of the general structure



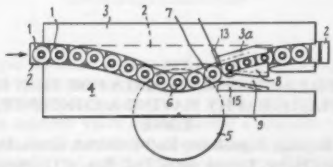
wherein R and R′ are individually alkyl radicals of about 4 to 18 carbon atoms and X is hydrogen or alkali metal or ammonium ion.

4,158,624

APPARATUS FOR DEFLECTING BOTTLES IN BOTTLE FEEDING APPARATUS

Geoffrey E. Ford; Antis Pantelides, and Trevor R. Willsmer, all of Bedford, England, assignors to TI Fords Limited, Bedford, England

Filed Jan. 30, 1978, Ser. No. 873,683
Claims priority, application United Kingdom, Mar. 21, 1977, 11874/77; Jul. 1, 1977, 27738/77
Int. Cl.[2] B07C *5/00*
U.S. Cl. 209—523 **6 Claims**



1. Bottle feeding apparatus comprising guide means defining a path along which bottles are adapted to be moved in an upright position in a single file, means for moving a stream of bottles along said path, means for deflecting the mouth of a bottle transversely to its direction of forward motion along said path to tilt the axis of the bottle, and a plough positioned adjacent to and downstream of where the deflecting means tilts a bottle, said plough being arranged to engage the neck of a deflected bottle and being shaped to displace the body of a deflected bottle sideways out of the stream of bottles moving in said path.

4,158,625

METHOD AND APPARATUS FOR DETECTING AND SCREENING FOREIGN MATTERS

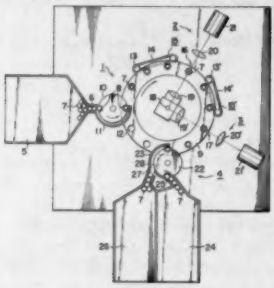
Toshio Takahashi, Honjo, and Ryosaku Tagaya, Isesaki, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1977, Ser. No. 820,308

Claims priority, application Japan, Aug. 20, 1976, 51/98594

Int. Cl.[2] B07C *5/342*

U.S. Cl. 209—524 12 Claims



1. A method for detecting and screening foreign matter, which comprises the steps of: generating a plurality of output signals from a plurality of detectors which signals are indicative of the presence or absence of foreign matter in a single sample; applying said detector output signals respectively to different pairs of comparators, simultaneously applying comparing reference voltages to the comparators of each pair so that one comparator of each pair is a high sensitivity comparator and the other comparator of each pair is a low sensitivity comparator, and generating comparator output signals in response to said detector output signals; simultaneously applying the output signals from all of said high sensitivity comparators to an AND circuit to generate an output signal from said AND circuit and simultaneously applying the output signals from all of said low sensitivity comparators to a first OR circuit to generate an output signal from said first OR circuit; simultaneously applying said output signal from said AND circuit and said output signal from said first OR circuit to a second OR circuit to generate an output signal from said second OR circuit; and utilizing said output signal from said second OR circuit to accept or reject said sample.

4,158,626

COATED CARRIER MATERIALS FOR THIN LAYER CHROMATOGRAPHY HAVING A CONCENTRATING ZONE

Herbert Halpaap, Jugenheim; Karl-Friedrich Krebs, Darmstadt, and Hans Heinz, Lorsch, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,591

Claims priority, application Fed. Rep. of Germany, May 31, 1977, 2724569

Int. Cl.[2] B01D *15/08*

U.S. Cl. 210—31 C 10 Claims

1. In a coated substrate for thin layer chromatography which has a concentrating zone layer located in side by side contact with and before the chromatography layer, the improvement wherein the concentrating zone layer consists essentially of porous silicon dioxide having a pore volume of 0.5 ml/g–1.5 ml/g and a pore width of 2–15 μm.

4,158,627

METHOD AND APPARATUS FOR EXTRACTING WASTE MATERIAL

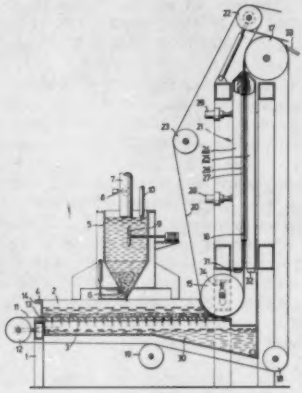
Gosta I. Ingemarsson, Säffle, Sweden, assignor to AB Källe-Regulatorer, Sweden

Filed Feb. 17, 1977, Ser. No. 769,534

Claims priority, application Switzerland, Feb. 27, 1976, 7602658

Int. Cl.[2] C02C *3/00*; B01D *33/04*

U.S. Cl. 210—49 10 Claims



1. A method for treating sludge as part of wastewater treatment comprising discrete and noncontinuing steps of:

adding flocculating agents to a quantity of sludge and stirring the mixture;

feeding the stirred mixture into a basin having a perforated bottom and upon a first perforated web to allow water to drain therefrom;

moving the web and hence the residue deposited thereon to a location out of said basin having a pair of linear plates; and

pressing the plates together to squeeze water from the residue between said plates,

said method further comprising the steps of passing the first web with the residue deposited thereon around a roll and covering the surface of the residue with a second perforated web moving with the first web to support the residue between the webs as they pass in a vertical direction between said plates.

6. Apparatus for draining sludge comprising a basin having a perforated bottom;

a closed loop perforated web and first guiding means including a plurality of rolls for guiding the web around an L-shaped loop;

one horizontal path portion of the L-shaped loop extending across the floor of said basin;

a common pressing roll positioned at one end of the basin for guiding the web through a turn to move along a path portion generally in the vertical direction;

a second closed loop perforated web;

second guiding means including a second plurality of rolls cooperating with said pressing roll to guide the second web about a predetermined path having one linear portion extending generally parallel to the vertical path portion of the first web;

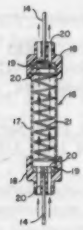
a pair of plates positioned on opposite sides of the vertical path portion adapted to squeeze the webs together when said plates are pressed together, and means to press said plates together.

4,158,628

SENSOR DEVICE FOR WATER SOFTENER SYSTEM

Andrew J. Fleckensteim, 20580 Enterprise Ave., Brookfield, Wis. 53005

Filed Jun. 5, 1978, Ser. No. 912,390
Int. Cl.[2] B01D *15/06*
U.S. Cl. 210—85 **2 Claims**



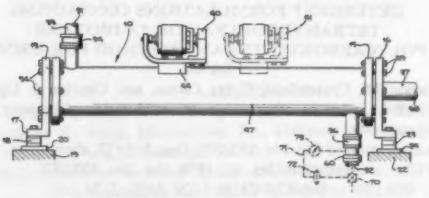
1. In a water treatment system for softening water a sensor device in a water treatment tank containing an ion exchange material, and a sensor element responsive to calcium/sodium conditions operatively associated with the sensor device, said sensor element being in direct contact with said ion exchange material and expansible and contractible according to said calcium/sodium condition, said sensor element being in the form of a tube, the exterior diameter of such tube being in direct contact with the water and the ion exchange material in the tank, and the water in the tank flows through the interior of the tube in direct contact therewith, said tube mounted in end pieces at respectively opposite ends of the tube, each said end piece having an opening to the interior of the tube, said end pieces each have a metallic interior surface, an electrical circuit operatively connected with said surfaces, and a circuit completing member in said tube normally out of contact with said surfaces brought into direct contact therewith by contraction of said tube in response to a calcium state in said treatment tank, and said circuit completing member comprising a metal spring having end contact with said surfaces to complete the electrical circuit and compressible after circuit completing contact is made upon further contraction of said tube.

4,158,629

DYNAMIC SELF-CLEANING FILTER FOR LIQUIDS

Harold T. Sawyer, Pacific Palisades, Calif., assignor to Vernon D. Beehler, Los Angeles, Calif., a part interest

Continuation-in-part of Ser. No. 496,396, Aug. 12, 1974, abandoned, Ser. No. 573,043, Apr. 30, 1975, abandoned, Ser. No. 633,818, Nov. 20, 1975, abandoned, and Ser. No. 716,529, Aug. 23, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 812,569
Int. Cl.[2] B01O *29/36*
U.S. Cl. 210—137 **13 Claims**



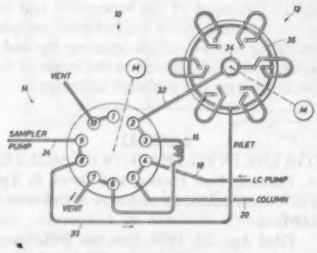
1. A continuous self-cleaning filter device for liquids comprising an elongated cylindrical outer tube having a wall of integral homogeneous resonant material, a non-resonant support for the tube at each end at respective wave length nodal points, said tube being free of support between said ends, a composite cylindrical inner tube of diameter smaller than said outer tube and concentric with respect to said outer tube forming an elongated annular chamber therebetween, a sealing support structure at each end of said chamber holding the respective ends of the tubes in spaced concentric relationship and holding said tubes intermediate said ends out of engagement with each other, an inlet passageway adjacent one end of said annular chamber for liquid to be filtered, an outlet passageway adjacent the other end of the chamber for discharge of fluid residue and a liquid pressure restricted control means in said outlet passageway productive of a condition wherein said annular chamber and said tubes are substantially continuously filled with liquid, said composite tube comprising a relatively thin-walled inner cylindrical liner having a perforated wall structure with inner and outer relatively hard surfaces, and a blanket of filter material over the outer surface of said wall structure pervious to the passage of liquid filtrate and impervious to the passage of filter pack solid material, there being a substantially clear central chamber in said liner with an opening at one end for collection and discharge of clear filtrate, and a continuously operating sinusoidal frequency energy inducing transducer having a fixed attachment to the wall of the outer tube on the exterior at a sonic wave length antinodal point relative to the ends of the outer tube, said outer tube in response to action of said transducer being continuously in resonance throughout its length and circumference in a sinusoidal wave pattern, said outer tube and the liquid in said annular chamber and in said blanket of filter material being in a resonant condition productive of a condition of continuous cavitation in the liquid in the chamber and the liquid in the blanket of filter material whereby to continuously dislodge residue from the blanket.

4,158,630

CHROMATOGRAPHIC MULTI-SAMPLE VALVING APPARATUS

Stanley D. Stearns, 7812 Bobbit, Houston, Tex. 77055

Filed Feb. 24, 1978, Ser. No. 881,164
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—198 C **7 Claims**



1. Sample injection apparatus for delivering a sequence of samples to a chromatographic detection apparatus which injection apparatus comprises:

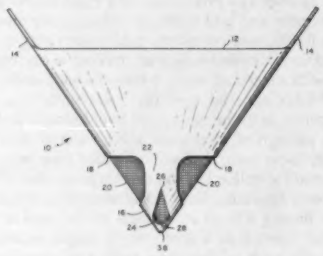
(a) loop selector valve means having a plurality of sample storage loops connected thereto and which further includes inlet and outlet means whereby individual samples can be stored in individual isolated storage loops connected thereto; and

(b) chromatographic column valve means including an inlet port and flow path for introduction of a specimen of interest to be stored in a particular storage loop of said loop selector valve means, a second flow path selectively serially communicated with said selected storage loop and a chromatographic column, and a third flow path selectively opened and closed through said column valve means from a sampler pump to said loop selector valve means and selectively flowing to said column valve means through said selected sample holding loop to deliver a selected sample to a chromatographic column.

4,158,631
PAINT STRAINER

James P. Whelan, North Marshfield, Mass., assignor to Ad-Tec Products, Inc., Plymouth, Mass.

Continuation of Ser. No. 770,077, Feb. 18, 1977, abandoned.
This application Apr. 20, 1978, Ser. No. 898,183
Int. Cl.[2] B01J 23/28
U.S. Cl. 210—497 R 1 Claim

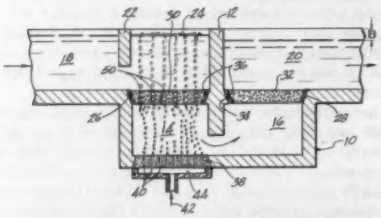


1. A paint strainer comprising a conical receptacle having a conically tapering side wall defining a conical interior chamber, said receptacle consisting of relatively stiff sheet material and comprising top, intermediate and bottom parts, said intermediate part containing diametral openings between which there are diametral wall portions of lesser peripheral width than the openings, the wall portions being integral with and connecting the top and bottom portions and being of sufficient strength in tension and stiffness in compression to prevent separation of the bottom part from the top part due to the weight of the paint and displacement of the bottom part upwardly into the top part from external pressure applied to the tip, and diametral openings in the intermediate part comprising discharge openings and said bottom part containing means consisting of a drainage opening of smaller area than the discharge openings situated in the wall of said bottom part with the lowest portion thereof at the level of the bottom of the interior chamber, but above the tip at the exterior such as to enable complete drainage of the receptacle and said bottom part below the opening being imperforate peripherally and means constituting a rigid, crush-resistant tip and a flexible, fine mesh screen material adhered to the inside of the chamber covering the discharge and drainage openings.

4,158,632
FILTER FOR USE IN FILTRATION OF MOLTEN METAL

Jonathan A. Dantzig, New Haven, and Derek E. Tyler, Cheshire, both of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 26, 1978, Ser. No. 900,066
Int. Cl.[2] C04B 21/00; C22C 1/04
U.S. Cl. 210—510 4 Claims



1. An improved filter plate means for use in the filtration and degassing of molten metal with a fluxing gas consisting essentially of at least one open cell structure consisting of a plurality of interconnected voids surrounded by a web consisting essentially of ceramic material and further including an array of holes of predetermined sizing and spacing, said holes being substantially larger than the pore size of said filter plate means; said predetermined sizing and spacing providing a preferential path through said filter plate means for said fluxing gas in countercurrent flow to said molten metal while at the same time passing substantially all of said molten metal through said pores of said filter plate.

4,158,633
LUBRICATING OIL

Andrew G. Papay, Manchester, Mo., assignor to Edwin Cooper, Inc., St. Louis, Mo.

Filed Mar. 30, 1978, Ser. No. 891,591
Int. Cl.[2] C10M 1/48, 3/42, 5/24, 7/46
U.S. Cl. 252—32.7 E 9 Claims

1. In a motor oil composition formulated for use as a crankcase lubricant for internal combustion engines, said formulated oil containing an ashless dispersant and an oil soluble alkaline earth metal salt of a petroleum sulfonic acid or an alkaryl sulfonic acid, the improvement comprising including an amount sufficient to reduce fuel consumption of said engine of a dimethyl $C_{12\text{-}30}$-alkyl phosphonate said improvement functioning to reduce fuel consumption of an internal combustion engine when said motor oil composition is used as the crankcase lubricating oil in said engine.

4,158,634
PARTICLES OF THERMOPLASTIC POLYMER, AND PROCESS OF MAKING THE SAME

Luigi Amariti, Niles; John S. Juskey, Rolling Meadows; Shapoor Azari, Wheeling, and Thomas J. Kucera, Evanston, all of Ill., assignors to Apeco Corporation, Des Plaines, Ill.

Filed Sep. 23, 1977, Ser. No. 836,039
Int. Cl.[2] G03G 9/08; C08K 5/00; B02C 23/18
U.S. Cl. 252—62.1 P 14 Claims

1. A process for preparing finely comminuted particles of a normally solid organic thermoplastic polymer, which comprises:

dissolving said polymer in a normally solid first solvent in a sufficient excess above a weight ration of 1:1 of said solvent to polymer to maintain said polymer and said solvent as a macroscopically homogenous, friable, solid composed predominantly of said solvent when the resulting mass is cooled, said dissolution being at an elevated temperature above the melting point of said solvent,

cooling said mass below the solidification temperature of said mass to form said macroscopically homogenous, friable solid mass and comminuting said solid mass,

removing said first solvent from said mass,

and recovering the normally solid organic thermoplastic polymer in finely comminuted form.

4,158,635
DETERGENT FORMULATIONS CONTAINING TETRAHYDROPYRAN OR 1,4-DIOXANE POLYCARBOXYLATES AND METHOD FOR USING SAME

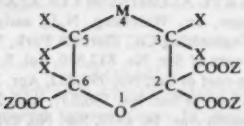
Marvin M. Crutchfield, Creve Coeur, and Charles J. Upton, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 857,070, Dec. 5, 1977, abandoned. This application Oct. 10, 1978, Ser. No. 950,182
Int. Cl.[2] C11D 3/20, 3/08, 7/54
U.S. Cl. 252—99 10 Claims

1. A detergent formulation comprising:

(a) from 0.5 to 95% by weight of a surfactant selected from the group consisting of water soluble anionic, nonionic, amphoteric and zwitterionic surfactants, and

(b) from 1 to 95% by weight of a compound of the molecular structure represented by the formula:



wherein M is 0 or CY_2, where Y is H or lower alkyl (C_1 to C_4), X is selected from the group consisting of H, lower alkyl (C_1 to C_4), or COOZ, Z represents H, R or a salt forming ion from the group alkali metal, ammonium, or trialkanolammonium, and R is an alkyl group (branched or straight chain) having up to about C_{20} in the chain.

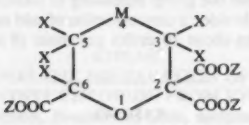
5. A machine dishwashing composition comprising:

(a) from 0 to 5% by weight of a surfactant selected from the group consisting of low-foaming anionic and nonionic surfactants and mixtures thereof,

(b) a chlorine providing material in an amount sufficient to provide from about 0.5 to 2% by weight of available chlorine,

(c) from 5 to 30% by weight soluble sodium silicate having an SiO_2 to Na_2O mole ratio of from 1:1 to 3.2:1, and

(d) from 5 to 90% by weight of one or more compounds having the molecular structure represented by the formula:



wherein M is 0 or CY_2, where Y is H or lower alkyl (C_1 to C_4), X is selected from the group consisting of H, lower alkyl (C_1 to C_4), or COOZ, Z represents H, R or a salt forming ion from the group alkali metal, ammonium, or trialkanolammonium, and R is an alkyl group (branched or straight chain) having up to about C_{20} in the chain.

4,158,636

Patent Not Issued For This Number

4,158,637

CONVERSION OF COAL INTO HYDROCARBONS

Andrew R. Jones, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 437,575, Jan. 29, 1974, Pat. No. 4,021,298. This application Apr. 30, 1976, Ser. No. 681,950

Int. Cl.[2] C10G *1/06;* **G21C** *15/00;* **C07C** *9/04;* **C10J** *3/00*

U.S. Cl. 208—449 R **9 Claims**

6. The process of dissociating water with apparatus including a high-temperature gas-cooled nuclear reactor, an electrolytic cell and thermochemical reacting means, said electrolytic cell including water to be dissociated; sulfuric acid and sulfur dioxide, the said method comprising circulating high-temperature gas physically isolated from, but in energy-exchange relationship with, the electrolytic cell to provide energy for said cell, dissociating the water in said cell to form hydrogen and also forming said sulfuric acid from said water and said sulfur dioxide, and circulating said high-temperature gas physically isolated from, but in heat exchange relationship with, said thermochemical means to dissociate said sulfuric acid into oxygen and said sulfur dioxide and also circulating said sulfur dioxide back to said electrolytic cell.

4,158,638

RECOVERY OF OIL FROM OIL SHALE

Shirley C. Tsai, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 27, 1978, Ser. No. 890,073

Int. Cl.[2] C10G *1/00;* **E21B** *43/24*

U.S. Cl. 208—11 LE **23 Claims**

1. A process for recovering oil from oil shale containing kerogen which comprises contacting said oil shale at a reaction temperature of about 300° C. to about 500° C. with steam having a partial pressure of about 450 to about 2500 psia and an organic solvent having a boiling point at ambient pressure of about 80° to about 500° C.

4,158,639

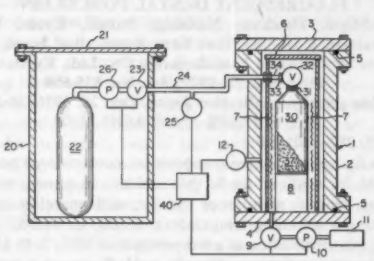
METHOD OF STORING GASES

Jozsef M. Berty, Erie, Pa., assignor to Autoclave Engineers, Inc., Erie, Pa.

Filed Nov. 14, 1977, Ser. No. 851,116

Int. Cl.[2] G21F *9/02*

U.S. Cl. 252—301.1 W **3 Claims**



1. A method of storing gas by high temperature and pressure absorption, adsorption or reaction with a bed of capturing solids comprising the steps for

(a) placing the capturing solids in a relatively thin-walled container having an opening therein connectable to a conduit,

(b) placing the thin-walled container in a pressurizable autoclave,

(c) bringing the opening in the thin-walled container into communication with a conduit extending through the walls of the autoclave and communicating with the source of gas to be stored,

(d) heating and simultaneously pressurizing the autoclave and the interior of the thin-walled vessel by pumping gas to be stored into the thin-walled vessel as gas is absorbed, adsorbed or reacted with the bed of solids,

(e) cooling and thereafter depressurizing the autoclave and the thin-walled vessel and its contents, and

(f) opening the autoclave, sealing said vessel, disconnecting the conduit from the thin-walled vessel and removing a substantially non-pressurized container loaded with absorbed, adsorbed or reacted gases.

4,158,640

STABLE LIQUID ANTIMONY ORGANIC SULFUR-CONTAINING COMPOUNDS

Dale J. Dieckmann, Euclid, Ohio, assignor to Dart Industries Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 592,038, Jun. 30, 1975, Pat. No. 4,029,618. This application Jun. 10, 1977, Ser. No. 805,372
The portion of the term of this patent subsequent to Jun. 14, 1994, has been disclaimed.
Int. Cl.[2] C09K *15/32*
U.S. Cl. 252—400 R 11 Claims

1. A liquid antimony composition, stable under ambient conditions, which consists essentially of:

a liquid comprising an antimony organic sulfur-containing compound having the formula

$$R_nSbX_{3-n}$$

where R of the formula is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, cycloalkyl, cycloalkenyl, mixed aryl-alkyl, and substituted groups thereof, where X of the formula is selected from the group consisting of sulfur, SR and SRCOOR′, where R of the group SR is selected from alkyl, aryl, mixed aryl-alkyl, and substituted groups thereof, where R of the group SRCOOR′ is selected from alkylene, arylene, aralkylene, and substituted groups thereof, wherein R′ of the group SRCOOR′ is selected from alkyl, aryl, mixed aryl-alkyl, and substituted groups thereof and where n is an integer of 0 to 2, and

as a stabilizer therefor an effective stabilizing amount representing only a minor proportion of said compound of a dihydric, trihydric or substituted mono-, di- or tri-hydric phenol.

4,158,641

FLUORESCENT DENTAL PORCELAIN

Kozo Miyai, Hirakata; Narishige Suzuki, Kyoto; Takaya Kawakami, Kyoto, and Ikuo Kuze, Kyoto, all of Japan, assignors to Shofu Dental Manufacturing Co., Ltd., Kyoto, Japan

Filed Sep. 22, 1977, Ser. No. 835,659
Claims priority, application Japan, Oct. 26, 1976, 51-128974
Int. Cl.[2] C09K *11/46;* A61C *13/00*
U.S. Cl. 252—301.4 F 4 Claims

1. A fluorescent dental composition, comprising a porcelain material for artificial teeth, that includes as a main material, feldspar, leucite, alumina or syenite; said porcelain material exhibiting a softening temperature of 600° C. to 800° C. and undergoes vitrification at a temperature of 900° C. to 1300° C; a fluorescent substance therein, said fluorescent substance consisting essentially of an aluminum silicate, alkali metal aluminosilicate, alkaline earth metal aluminosilicate, alkali metal aluminate, alkaline earth metal aluminate, or mixtures thereof wherein said alkali metal is sodium or potassium and said alkaline earth metal is magnesium, calcium, barium or strontium; and

an activator therefor selected from the group consisting of europium, and europium and at least one of cerium or ytterbium as an auxiliary activator; and

wherein said fluorescent substance is present in said dental composition in a concentration of not more than one percent by weight of said porcelain material;

said europium, calculated as Eu_2O_3, is present in an amount of not more than four percent by weight of said fluorescent substance;

the molar content of alkali or alkaline earth metal present calculated as the oxide thereof does not exceed four times the molar content of alumina present in said fluorescent substance; and

wherein said fluorescent dental composition exhibits a fluorescence within the range of violet white to milky white blue when excited by ultra-violet radiation of about 3650 A wavelength.

4,158,642

TRIALKYL ALUMINUM COCATALYST

Arthur W. Langer, Jr., Watchung, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 812,530, Jul. 5, 1977, which is a continuation-in-part of Ser. No. 790,832, Apr. 25, 1977, and a continuation-in-part of Ser. No. 790,837, Apr. 25, 1977. This application Apr. 14, 1978, Ser. No. 896,561
Int. Cl.[2] C08F *4/46, 4/50, 4/52*
U.S. Cl. 252—429 B 26 Claims

1. An improved catalyst composition adaptable for use in polymerizations which comprises a mixture of:

(a) a titanium metal compound on a support, said titanium metal compound selected from the group consisting of $TiCl_3$, $TiCl_4$, $TiBr_3$ and $TiBr_4$ and mixtures thereof;

(b) at least one alkyl metal compound having the formula: $R_nMR'_{3-n}$, wherein R′ is selected from the group consisting of C_1 to C_{20} primary alkyl, alkenyl and aralkyl groups and hydride, R is selected from the group consisting of a C_3–C_{20} secondary or tertiary alkyl, neopentyl alkyl, cycloalkyl, and a secondary or tertiary alkenyl and aralkyl groups, M is selected from the group consisting of Al, Ga and In, n is equal to 0–2; wherein said composition includes at least one Lewis base with the proviso that said Lewis base does not cause excessive cleavage of metal-carbon bonds or loss of active sites, a molar ratio of said alkyl metal compound to said transition metal compound being about 0.5:1 to about 200:1; and

(c) a salt of a Group IA to Group IIIA metal, said salt being selected from the group consisting of alkoxides, carboxylates, or aryloxides, a concentration of said metal salt being about 0.1 to about 20 moles per mole of said $R_nMR'_{3-n}$ compound.

4,158,643

CATALYTIC CARBON FOR OXIDATION OF CARBON MONOXIDE IN THE PRESENCE OF SULFUR DIOXIDE

Rabindra K. Sinha, Coraopolis, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 705,649, Jul. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 557,209, Mar. 12, 1975, abandoned. This application Sep. 9, 1977, Ser. No. 832,043
Int. Cl.[2] B01J *21/18, 31/02;* C10K *1/20;* B01J *8/00*
U.S. Cl. 252—447 8 Claims

1. In the method of preparing activated carbon supported catalysts for oxidation of carbon monoxide, comprising the step of impregnating an activated carbon support with a catalyst composition comprising one or more members selected from the group consisting of Cu, Cr, Ni, Fe, Mn, Au, Ag, Pt, Pd, Rh and oxides and chloride, hydroxide, carbonate and nitrate salts thereof,

the improvement comprising the additional steps of, first, oxidatively modifying said activated carbon support by treating said carbon support with a fluid oxidizing agent prior to impregnating thereof with said catalyst, whereby oxygen is added to the surface of said activated carbon support in an amount of from about 1% to about 5% by weight of said activated carbon support and the reducing properties of said activated carbon support are substantially reduced,

provided that, where the oxidizing agent is an oxyacid, that the acid is employed in a concentration of from 1 to 15 weight %, and in an amount, expressed as a weight ratio of acid to activated carbon, of from 1:1 to 5:1, whereby weight loss from the activated carbon as a result of acid treatment does not occur,

and, second, impregnating said activated carbon support with an inert hydrophobic compound in an amount of from about 1% to about 20% by weight of said activated carbon, before the step of impregnating said activated carbon support with said catalyst composition,

said improvement resulting in an activated carbon supported

catalyst having improved efficiency in the presence of sulfur dioxide.

4,158,644

CLEANER AND GREASE EMULSIFIER

Richard J. Hammerel, Downers Grove, Ill., assignor to Kewanee Industries, Inc., Bryn Mawr, Pa.

Filed Mar. 17, 1978, Ser. No. 887,785
Int. Cl.[2] C11D *1/90, 1/62, 1/835, 7/32*
U.S. Cl. 252—547 **5 Claims**

1. An aqueous hard surface detergent composition consisting essentially of (1) a polyglycol ether condensate of a member of the group consisting of nonyl phenol having an average of about 9.5 moles of ethylene oxide per mole of condensate, octyl phenol having from 9 to 13 moles of ethylene oxide per mole of condensate, and mixtures thereof; (2) a quaternary ammonium salt selected from the group consisting of alkyl dimethyl benzyl ammonium chloride, alkyl dimethyl ethylbenzyl ammonium chloride in which the alkyl chains have from 12 to 18 carbon atoms, and mixtures thereof, and (3) a member selected from the group consisting of acylamidopropyldimethylamino acetic acid and its anion, the acyl portion of the acylamidopropyl chain being derived from the fatty acids of coconut oil; the ratio of the respective components (1), (2) and (3) being about 4.5:3:1 by weight, and total concentration of components (1), (2) and (3) being between 0.1 and 4% by weight.

4,158,645

CATALYST FOR THE PREPARATION OF ETHYLENE AND VINYL CHLORIDE FROM ETHANE

Angelo J. Magistro, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 669,895, Mar. 24, 1976, Pat. No. 4,102,936. This application Mar. 16, 1978, Ser. No. 887,166
Int. Cl.[2] B01J *21/04, 23/10, 23/74, 23/84*
U.S. Cl. 252—462 **10 Claims**

1. A solid solution catalyst consisting essentially of iron cations substituted for aluminum cations in a host lattice of α-Al_2O_3 and having an iron content of from about 0.1 percent to 20 percent by weight expressed as the oxide; stabilized with a total lanthanide content of from about 0.1 percent to 20 percent by weight expressed as the oxide; and modified with a total content of one or more metal cations selected from the group consisting of lithium, cobalt, copper, magnesium, chromium, and manganese of from about 0.05 percent to about 3 percent by weight expressed as the oxide; and having an X-ray diffraction pattern having peak positions different than that of the host lattice, all weight percents based upon the weight of the catalyst.

4,158,646

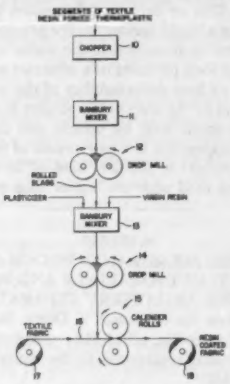
METHOD FOR REPROCESSING SCRAP FROM FABRIC REINFORCED THERMOPLASTIC SHEET

William J. Benkowski, Jeannette, Pa.; Richard L. Fishel, Akron, and Francis J. Maurer, Tallmadge, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 574,198, May 5, 1975, abandoned, which is a continuation of Ser. No. 451,390, Mar. 15, 1974, abandoned, which is a continuation of Ser. No. 310,503, Nov. 29, 1972, abandoned. This application Apr. 15, 1976, Ser. No. 677,102
Int. Cl.[2] B29B *1/04;* **B29C** *29/00;* **B02C** *17/00*
U.S. Cl. 260—2.3 **1 Claim**

1. In a method of recovering a useable product from scrap cotton fabric backed vinyl sheet by disintegrating the scrap and recovering a vinyl component which can be reused to manufacture a product,

wherein the improvement comprises milling the scrap cotton fabric backed vinyl in a cooled mill,



(a) to tear the fabric into fibers having lengths no greater than 0.250 inch; and

(b) to mix the fibers into the vinyl.

4,158,647

MULTIFUNCTIONAL ACRYLATE N-VINYLAMIDE ANAEROBIC ADHESIVE COMPOSITIONS

Julian L. Azoriosa, Kinnelon, N.J., assignor to GAF Corporation, New York, N.Y.

Division of Ser. No. 757,473, Jan. 7, 1977, Pat. No. 4,104,458. This application Mar. 6, 1978, Ser. No. 883,467
Int. Cl.[2] C08F *220/20*
U.S. Cl. 260—13 **8 Claims**

1. A solventless, fast-setting adhesive composition consisting essentially of two monomer parts which are adapted to be copolymerized anaerobically at ambient temperature between opposing surfaces to form a high-strength bond thereto one of said parts being an ethylenically unsaturated polymerizable multifunctional acrylate monomer and the other part an N-vinylamide monomer, one of said parts having an oxidizing agent present therein and the other part a reducing agent, said agents being capable of reacting when brought together to initiate copolymerization of said monomers to form said desired bond, characterized in that a soluble resin is included with said first or second parts, to increase the viscosity of the monomer in that part to that of a viscous liquid, but not inhibit the polymerization.

4,158,648

PRESSURE- AND HEAT-SENSITIVE COATINGS

Frederick W. Meadus; Ira E. Puddington, and Bryan D. Sparks, all of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 669,754, Mar. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 316,726, Dec. 20, 1972, Pat. No. 3,967,034. This application Dec. 19, 1977, Ser. No. 861,873
Claims priority, application Canada, Dec. 12, 1971, 130879; Mar. 25, 1977, 274536
Int. Cl.[2] C08L *31/04, 31/02, 61/24*
U.S. Cl. 260—15 **27 Claims**

1. A thixotropic composition, which on drying on a substrate forms a pressure- and heat-sensitive coating having voids of about 0.05 to 10 micrometers in diameter, comprising meldable metal soap particles of about 0.05 to 10 micrometers in diameter and having a cation selected from the group consisting of calcium, nickel, iron, copper, manganese, and lithium obtained as contiguous fine precipitated particles by double decomposition in water and having a melting point above

about 150° C., the particles being of substantially uniform colour, that will provide a visible change from an opaque colour to a contrasting colour or transparent form when subjected to plastic flow or definite deformation by heat or pressure, water, being a liquid carrier for the precipitated soap, and a binder, dispersed or dissolved in the water to provide adhesion for the metal soap particles to a substrate without decreasing the pressure or heat deformability of the metal soap particles, the fatty acid of the soap being present in a concentration of about 7% to about 20% by weight and the binder being present in the composition in a proportion of from about 40 to about 120% by weight of the fatty acid of the soap, the lower proportions being used with the higher soap concentrations.

4,158,649

POLYMERIC MEMBRANES WHICH CONTAIN POLYPHENYLQUINOXALINES AND WHICH ARE USEFUL AS BATTERY SEPARATORS

Isaac Angres, Silver Spring; James V. Duffy, Beltsville, and Sol J. Matesky, Hyattsville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 17, 1977, Ser. No. 843,002

Int. Cl.[2] C08L *1/10*; C09K *3/00*

U.S. Cl. 260—17 R **34 Claims**

1. A polymeric membrane comprising a homogeneous mixture of:

(1) from about 30 to about 50 weight percent of a hydrophilic resin which is selected from the group consisting of

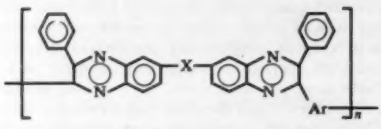
(a) a partially acetylated cellulose in which from about 50 to less than 100 percent of the hydroxyl groups are acetylated,

(b) polyvinyl acetate,

(c) hexadimethrine bromide, and

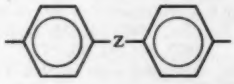
(d) mixtures thereof; and

(2) from about 50 to about 70 weight percent of a polyphenylquinoxaline of the formula



wherein X is selected from the group consisting of a direct bond,

wherein Ar is selected from the group consisting of m-phenylene, p-phenylene, and



wherein Z is selected from the group consisting of a direct bond,

and wherein n has a value such that the polyphenylquinoxaline has an inherent viscosity of from about 0.5 to about 2.5 dl./g. as a 0.5 g. in 100 ml solution in 98 percent sulfuric acid at about 30° C.

4,158,650

PROCESS FOR PRODUCING MODIFIED PHENOLIC RESIN

Nobukatsu Kato; Tsutomu Takase, both of Nagoya; Yoshio Morimoto, Tokai; Takashi Kataoka, and Minoru Hattori, both of Nagoya, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jul. 25, 1978, Ser. No. 927,780

Claims priority, application Japan, Aug. 4, 1977, 52-92969; Sep. 12, 1977, 52-108920; Sep. 26, 1977, 52-114709; Nov. 17, 1977, 52-137244

Int. Cl.[2] C08G *8/32, 8/34*

U.S. Cl. 260—19 UA **5 Claims**

1. A process for producing a modified phenolic resin by using a drying oil introduced with phenols, the process comprising the steps of:

reacting a drying oil having an iodine value of more than 140 and a content of conjugated double bonds of less than 50% with isopropenylphenol and/or oligomers thereof in the presence of an acidic catalyst and in the presence or absence of phenols to introduce the isopropenylphenol and/or oligomers thereof to said drying oil;

further reacting said drying oil which has been introduced with the isopropenylphenol and/or oligomers thereof with at least one phenol in the presence of an acidic catalyst to introduce said at least one phenol to said drying oil; and

providing said drying oil which has been introduced with the isopropenylphenol and/or oligomers thereof and said at least one phenol, as part of a phenolic component to react with formaldehyde or compounds based on formaldehyde.

4,158,651

Patent Not Issued For This Number

4,158,652

HIGH SOLIDS COMPOSITIONS CONTAINING ESTER DIOL ALKOXYLATES

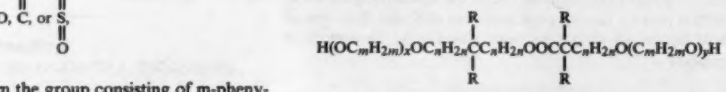
Joseph V. Koleske, Charleston; Robert J. Knopf, Saint Albans, and Oliver W. Smith, South Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,731

Int. Cl.[2] C08L *61/24, 61/28, 75/08*

U.S. Cl. 260—29.4 UA **15 Claims**

1. A high solids composition comprising a blend of (I) an ester diol alkoxylate of the formula:



wherein m is an integer having a value of from 2 to 4; n is an integer having a value of from 1 to 5; x and y are integers having a value of from 1 to 20 and R is an unsubstituted or substituted alkyl group having from 1 to 8 carbon atoms and (II) from 10 to 300 weight percent thereof of at least one member selected from the group consisting of:

(A) an aminoplast crosslinker; or

(B) an aminoplast crosslinker and a polycaprolactone polyol having an average molecular weight of from 290 to about 6,000, an average hydroxyl number of from about 15 to 600 and an average of from 2 to 6 hydroxyl groups; or

(C) an aminoplast crosslinker and a carboxyl modified polycaprolactone adduct reaction product mixture of the reaction of (i) a polycaprolactone polyol and (ii) from 0.1 to 1 carboxylic acid anhydride equivalent for each hydroxyl equivalent present in the polycaprolactone polyol of an intramolecular anhydride of a polycarboxylic acid; or

(D) an aminoplast crosslinker and a low molecular weight polyol having a molecular weight of from 62 to about 1,000 and from 2 to 6 hydroxyl groups; or

(E) an aminoplast crosslinker and an aqueous acrylic latex.

4,158,653

ELASTOMER BLEND COMPOSITION OF A SULFONATED EPDM TERPOLYMER AND A POLYSTYRENE RESIN

Chan I. Chung, Schenectady, N.Y., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 26, 1977, Ser. No. 791,162
Int. Cl.[2] C08L *23/16*
U.S. Cl. 260—33.6 AQ **6 Claims**

1. An elastomeric blend composition, which comprises:

(a) a neutralized sulfonated EPDM terpolymer; and

(b) about 1 to about 20 parts per hundred by weight of a thermoplastic resin based on 100 parts of said neutralized sulfonated EPDM terpolymer, said thermoplastic resin being selected from the group consisting of poly alpha methylstyrene, poly-t-butylstyrene, polyhalo-styrene, and polystyrene and mixtures thereof.

4,158,654

CARBOXYLIC ACID IN ALKALI METAL CARBOXYLATE RUBBER SOLUTION

George A. Moczygemba, and Aubrey South, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 20, 1978, Ser. No. 888,068
Int. Cl.[2] C08K *7/14*; C08L *67/06*
U.S. Cl. 260—40 R **23 Claims**

1. A composition resulting from mixing ingredients comprising

(a) an unsaturated polyester prepared by reacting an unsaturated dicarboxylic acid and a polyol;

(b) a normally solid alkali metal carboxylate-containing rubber;

(c) a carboxylic acid;

(d) a vinyl monomer;

(e) a catalyst; and

(f) a reinforcing agent.

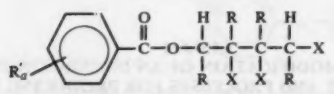
4,158,655

MONOHALOALKENYL BENZOATES AND TRIHALOALKYL BENZOATES

Donnie G. Brady, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 245,387, Apr. 19, 1972, Pat. No. 3,879,445. This application Jan. 13, 1975, Ser. No. 540,568
Int. Cl.[2] C08K *5/10*; C07C *69/78*
U.S. Cl. 260—45.75 B **21 Claims**

1. A flame retarded polymeric composition incorporating at least one poly(1-monoolefin) polymer together with an effective flame-retarding amount of at least one 2,3,4-trihaloalkyl ester of benzoic acid represented by the general formula



(III)

wherein each R represents hydrogen or a radical which is alkyl, cycloalkyl, aryl, aralkyl, or alkaryl; X is chlorine, bromine, or iodine; each R′ is individually selected from hydrogen, alkyl, X or fluorine; a is 5; wherein the total number of carbon atoms per 2,3,4-trihaloalkyl ester of benzoic acid does not exceed 20; and wherein the halogen in the 2- and 3-position are the same.

4,158,656

OILSEED PROCESSING

John D. Jones, and John Holme, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Feb. 27, 1978, Ser. No. 881,490
Int. Cl.[2] A23J *1/14*
U.S. Cl. 260—123.5 **11 Claims**

1. A process for the production of a protein concentrate for a dehulled, defatted oleaginous thioglucoside and phenolic containing seed material, in which the protein has not been subjected to denaturing conditions, comprising the steps of:

(a) contacting said seed material with an aqueous-lower alkanol solvent solution to thereby selectively extract glucosinolates, phenolic compounds and pigments therefrom at a temperature below 60° C. and under conditions so as to prevent oxidation of said phenolic compounds and inhibiting enzymic degradation of glucosinolates;

(b) separating the liquid extract phase from a solid residue; and

(c) drying the solid residue at a temperature below about 60° C. to thereby recover said protein concentrate.

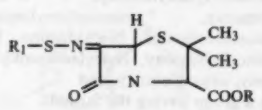
4,158,657

THIOOXIME PENICILLIN DERIVATIVES

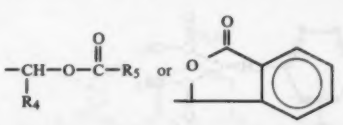
Eric M. Gordon, West Trenton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 748,425, Dec. 8, 1976, Pat. No. 4,109,084. This application Nov. 9, 1977, Ser. No. 849,726
Int. Cl.[2] C07D *277/04*
U.S. Cl. 260—306.7 C **8 Claims**

1. A compound of the formula:



R is hydrogen, lower alkyl of 1 to 4 carbons, benzyl, p-methoxybenzyl, p-nitrobenzyl, diphenylmethyl, 2,2,2-trichloroethyl, tri-(lower alkyl)silyl, lower alkoxymethyl,



R_1 is lower alkyl of 1 to 4 carbons, phenyl, or phenyl having a halo, lower alkyl of 1 to 4 carbons, or lower alkoxy of 1 to 4 carbons substituent; R_4 is hydrogen or lower alkyl of 1 to 4 carbons; and R_5 is lower alkyl of 1 to 4 carbons.

4,158,658

BICHROMOPHORIC BENZOXAZOLE-STYRENE ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

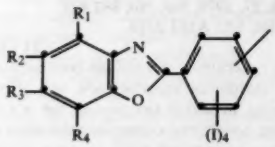
Gether Irick, Jr.; Charles A. Kelly, both of Kingsport, and James C. Martin, Johnson City, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 715,012, Aug. 16, 1976, Pat. No. 4,075,162. This application Nov. 14, 1977, Ser. No. 851,322
Int. Cl.[2] C07D *263/56*
U.S. Cl. 260—307 D **62 Claims**

1. A compound having the formula:

A—B—C

wherein A is a group having the structure

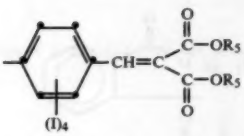


wherein

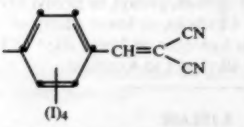
R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, lower alkyl, substituted lower alkyl, cyclohexyl, substituted cycloalkyl, phenyl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, substituted amino, cyano, carboalkoxy, acetamido and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

I is the same as R_1, R_2, R_3 and R_4 wherein B is a linking group connecting A and C and is oxy, carbonyloxy, oxycarbonylalkyleneoxy, oxyalkyleneoxycarbonyloxy, oxyalkylenecarbonyloxy, oxycarbonyloxy, alkyleneoxy, alkyleneoxyalkyleneoxy, oxyalkylenearylenealkyleneoxy, thio, thioalkyleneoxy, sulfinyldioxy, oxy(alkoxy)phosphinooxy, carbonylamino, N-alkylcarbonylamino, N-arylcarbonylamino, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-arylaminocarbonylalkyleneoxy, aminocarbonylamino, N-alkylaminocarbonylamino, N-alkylamino, N-arylamino, N-alkylaminoalkyleneoxy, N-arylaminoalkyleneoxy, oxyalkyleneoxy, oxyaryleneoxy; and

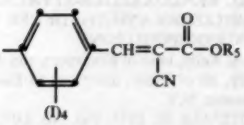
wherein C is a group having the formula



1.



2.



3.

where I is the same substituent as listed above and is present in all positions of the benzenoid rings except the carbon atom attached to the B group connecting the A and C moieties, and said I substituents can all be one of the substituents listed above or different listed substituents and R_5 is an alkyl group containing 1 to 20 carbon atoms or a hydroxyalkyl group or an alkoxyalkyl group.

4,158,659

ACYLAMINO DERIVATIVES

William J. Ross, Lightwater; John P. Verge, Henley-on-Thames, and William R. N. Williamson, Slough, all of England, assignors to Lilly Industries Limited, London, England

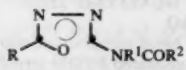
Continuation of Ser. No. 691,962, Jun. 1, 1976, abandoned. This application Oct. 7, 1977, Ser. No. 840,345

Claims priority, application United Kingdom, Jun. 5, 1975, 24224/75

Int. Cl.[2] **C07D** *271/10, 285/12;* **A61K** *31/42, 31/425*

U.S. Cl. 260—307 G **6 Claims**

1. A compound of the formula



wherein:

R is C_{1-4} alkyl; R^1 is C_{1-6} alkyl, C_{3-6} alkenyl, C_{3-8} cycloalkyl or benzyl optionally substituted by C_{1-3} alkyl or halogen and R^2 is C_{1-6} alkyl, C_{3-8} cycloalkyl, phenyl or benzyl.

4,158,660

PROCESS FOR PRODUCING A PURIFIED 3,4-TOLUENEDIAMINE PRODUCT AND A MIXTURE OF 4- AND 5-METHYLBENZOTRIAZOLES FROM A MIXTURE OF ORTHO-TOLUENEDIAMINE ISOMERS

David F. Gavin, Cheshire, Conn.; Alan E. Ardis, San Diego, Calif.; Lawrence E. Katz, Orange, Conn., and John D. Schellberg, Downers Grove, Ill., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 24, 1978, Ser. No. 880,837

Int. Cl.[2] **C07D** *249/18*

U.S. Cl. 260—308 B **13 Claims**

1. A process for producing a purified 3,4-toluenediamine product and a mixture of 4- and 5-methylbenzotriazoles from a mixture of ortho-toluenediamine isomers comprising about 40% to about 70% by weight 3,4-toluenediamine isomer and about 30% to about 60% by weight 2,3-toluenediamine isomer, said process comprising the steps of

(a) dissolving said mixture of ortho-toluenediamine isomers in water to form an aqueous solution;

(b) cooling said aqueous solution to a temperature whereby crystals of a purified 3,4-toluenediamine product are formed in an aqueous mother liquor;

(c) separating said purified 3,4-toluenediamine product from said aqueous mother liquor;

(d) reacting said aqueous mother liquor with a diazotization agent selected from sodium nitrite, potassium nitrite, nitrous acid and nitrous anhydride in the presence of acetic acid to form a reaction mixture containing a mixture of 4- and 5-methylbenzotriazoles;

(e) recovering at least a portion of said 4- and 5-methylbenzotriazoles from said reaction mixture.

4,158,661

STABLE MODIFICATION OF AN ISOINDOLINONE PIGMENT AND PROCESSES FOR PRODUCING IT

Fridolin Bäbler, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

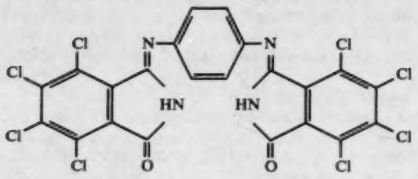
Filed Jan. 26, 1978, Ser. No. 872,403

Claims priority, application Switzerland, Feb. 3, 1977, 1316/77

Int. Cl.[2] **C07D** *209/50;* **C09B** *57/00*

U.S. Cl. 260—325 PH **8 Claims**

1. Isoindolinone pigment of the formula I



in a new stable modification, characterised by an X-ray diffractogram of which the four strongest lines correspond to interplanar spacings between 9.1 and 9.0, 3.56 and 3.52, 3.41 and 3.37 and also 2.98 and 2.95 Å.

3. A process for producing a new stable modification of the isoindolinone pigment according to claim 1, which comprises treating under anhydrous conditions the isindolinone of the formula I with liquid ammonia or a liquid alkylamine which contains 1–4 carbon atoms, and in which the pigment is insoluble or essentially insoluble; and isolating the converted pigment under anhydrous conditions.

4,158,662

PHTHALIMIDES SUBSTITUTED BY ALKENYLAMINO GROUPS

Roland Darms, Therwil, and Hubert Meindl, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

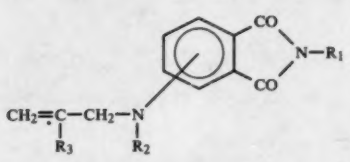
Filed Dec. 5, 1977, Ser. No. 857,156

Claims priority, application Switzerland, Dec. 14, 1976, 15704/76

Int. Cl.[2] **C07D** *403/12, 403/10, 209/48*

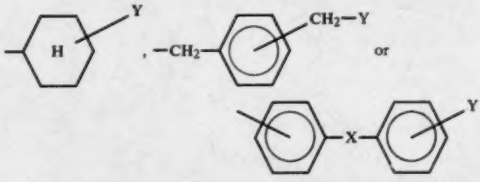
U.S. Cl. 260—326 N **5 Claims**

1. A phthalidimide of the formula I



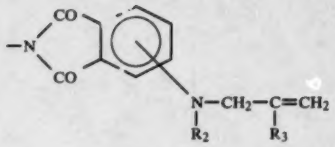
(I)

in which R_1 is alkyl having 1 to 12 carbon atoms, alkenyl having 2 to 5 carbon atoms, phenyl; phenyl substituted by halogen, by alkyl of 1 to 4 carbon atoms or by alkoxy of 1 to 4 carbon atoms; naphthyl, alkylene-Y having 2 to 12 carbon atoms in the alkylene part, arylene-Y in which arylene is phenylene; phenylene substituted by halogen, by methyl or by methoxy; or naphthylene, or a grouping

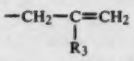


in which X is —CH_2—, —S—, —SO—, —SO_2—, —O— or

and Y is a grouping



R_2 is hydrogen or



and R_3 is hydrogen or methyl.

4,158,663

PROCESS FOR THE PRODUCTION OF 2-SUBSTITUTED CHROMONES

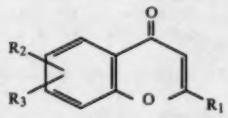
David T. Connor, Ann Arbor, Mich.; Patricia A. Young, Madison, N.J., and Max von Strandtmann, New Castle, Del., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 816,122, Jul. 15, 1977. This application Mar. 31, 1978, Ser. No. 891,983

Int. Cl.[2] **C07D** *311/22*

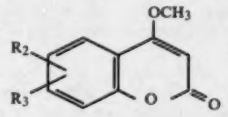
U.S. Cl. 260—345.2 **2 Claims**

1. A process for the production of a compound of the formula:



I.

in which R_1 is (methylsulfinyl)methyl, and R_2 and R_3 are hydrogen, halogen, lower alkyl, lower alkoxy or hydroxy, which comprises treating a compound of the formula:



II.

with sodium methyl-sulfinylmethide at ambient temperature.

4,158,664

PROCESS FOR IMPROVING COLOR OF CERTAIN ALKENYL SUCCINIC ANHYDRIDES

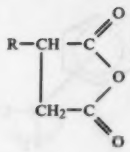
Charles M. Selwitz, Monroeville, and Helen I. Thayer, Oakmont, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jun. 17, 1977, Ser. No. 807,369

Int. Cl.[2] **C07D** *307/60;* **C07C** *51/00*

U.S. Cl. 260—346.74 **5 Claims**

1. A process for improving the color of the reaction product of an olefin with maleic anhydride which comprises reacting a straight or branched chain olefin having from 26 to 100 carbon atoms, said olefin having been obtained as a result of the polymerization of ethylene, with maleic anhydride in a temperature range of about 140° to about 250° C. for about three to about 60 hours to obtain an alkenyl succinic anhydride dark in color having the following structural formula:



wherein R is an alkenyl group having from 26 to 100 carbon atoms, bringing the alkenyl succinic anhydride at a temperature of about 75° to about 150° C. into contact with water at a temperature of about 0° to about 80° C. wherein the amount of water used relative to said alkenyl succinic anhydride on a molar basis ranges from about 10:1 to about 1000:1, mechanically stirring the resulting mixture over a period of about one-half to about three hours while maintaining the temperature of the water within the range of about 10° to about 80° C., resulting in the solidification of the alkenyl succinic anhydride and the conversion thereof to the corresponding alkenyl succinic acid in particulate form, and then mechanically separating the water from the alkenyl succinic acid to obtain alkenyl succinic acid of improved color.

5. The process of claim 1 wherein at the end of said treatment the alkenyl succinic acid is converted to the corresponding alkenyl succinic anhydride.

4,158,665

HYDROGENATION OF GLYCERIDE OILS

John M. Hasman, Chatham, N.J., assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 733,348, Oct. 18, 1976, abandoned. This application Nov. 10, 1977, Ser. No. 850,150

Int. Cl.[2] C11C *3/12*

U.S. Cl. 260—409 **13 Claims**

1. A process for the hydrogenation of a glyceride oil contaminated with soap wherein the resulting hydrogenated product has an Iodine Value (IV) at least as low as about 100, comprising:

subjecting said oil to hydrogenation in a hydrogenation zone with hydrogen gas under hydrogenation conditions in the presence of greater than 0.02 weight-percent nickel hydrogenation catalyst and of greater than about 0.25 weight-percent copper-chromite adjunct catalyst, both weight-percentages based on the weight of the oil in said zone; and

establishing and maintaining the concentration of said adjunct catalyst in said zone broadly proportional to the soap concentration in said feed oil fed to said zone, said soap concentration being from about 0.01 to about 0.25 weight-percent by weight of said feed oil,

said hydrogenation proceeding substantially insensitively to the presence of said contaminant soap in said feed oil.

4,158,666

STEARINE PRODUCTION

John M. Hasman, Chatham, N.J., assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 778,710, Mar. 17, 1977, abandoned. This application Nov. 10, 1977, Ser. No. 850,160

Int. Cl.[2] C11C *3/12*

U.S. Cl. 260—409 **14 Claims**

1. A process for the hydrogenation of a glyceride oil wherein the resulting hydrogenated product has an Iodine Value (IV) not substantially above about 30, comprising

subjecting said oil to primary hydrogenation in a primary hydrogenation zone with hydrogen gas under hydrogenation conditions in the presence of greater than 0.02 weight-percent nickel hydrogenation catalyst and of greater than about 0.25 weight-percent copper-chromite adjunct catalyst, said catalyst weight-percentages based on the weight of said oil in said primary zone;

establishing and maintaining the concentration of said adjunct catalyst in said primary zone broadly proportional to the soap concentration in said oil, said soap concentration being from about 0.003 to about 0.25 weight-percent by weight of said oil;

discontinuing said primary hydrogenation at an intermediate Iodine Value (IV) of the oil in said primary zone of at least about 10% less than the Iodine Value (IV) of the oil fed to said primary zone;

separating at least said adjunct catalyst from said oil;

subjecting said primary hydrogenated oil to secondary hydrogenation in a secondary hydrogenation zone with hydrogen gas under hydrogenation conditions in the presence of about 0.01 to about 0.3 weight-percent nickel hydrogenation catalyst based on the weight of said oil in said secondary zone;

discontinuing said secondary hydrogenation when the Iodine Value (IV) of the oil in said secondary zone is less than said intermediate Iodine Value and not substantially above about 30; and

withdrawing said resulting hydrogenated product from said secondary hydrogenation zone.

4,158,667

6-KETO PGF ANALOGS

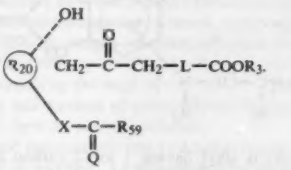
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 725,548, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,972, Aug. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 655,110, Feb. 4, 1976, abandoned. This application Jul. 28, 1977, Ser. No. 819,857

Int. Cl.[2] G07G *177/00*

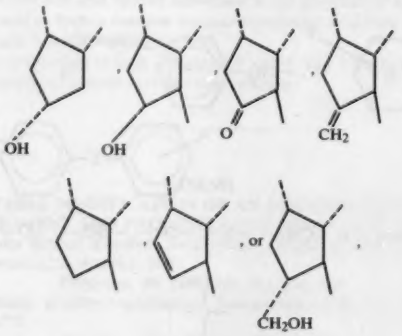
U.S. Cl. 260—413 **30 Claims**

1. A compound of the formula



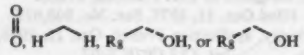
or a mixture comprising that compound and the enantiomer thereof

wherein (R_{20}) is

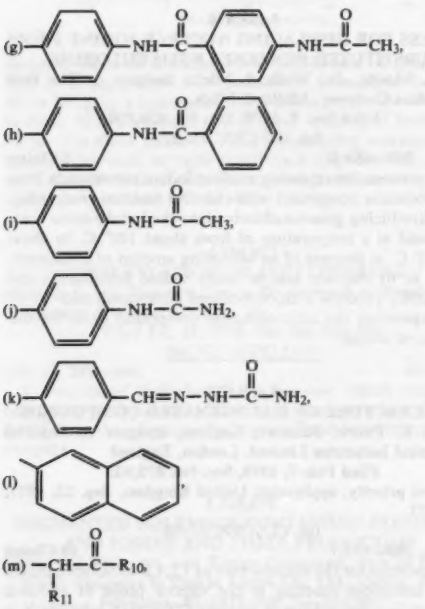


wherein L is

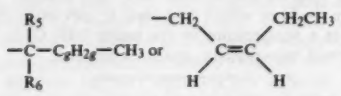
(1) $-(CH_2)_d-C(R_2)_2-$
(2) $-(CH_2-O-CH_2-Y-$ or
(3) $-CH_2CH=CH-$
wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $-CH_2-$ or $-(CH_2)_2-$,
wherein Q is



wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_8 is (a) hydrogen, (b) alkyl of one to 12 carbon atoms, inclusive, (c) cycloalkyl of 3 to 10 carbon atoms, inclusive, (d) aralkyl of 7 to 12 carbon atoms, inclusive, (e) phenyl, (f) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,



wherein R_{10} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and wherein R_{11} is hydrogen or benzoyl, or (n) a pharmacologically acceptable cation, wherein R_{59} is



wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro; and wherein X is
(1) trans—CH=CH—
(2) cis—CH=CH—
(3) —C≡C— or
(4) $-CH_2CH_2-$;
including the lower alkanoates thereof.

4,158,668

PREPARATION OF CARBOXYLIC ACIDS FROM INTERNAL OLEFINS

Donald E. Morris, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 12, 1977, Ser. No. 841,424
Int. Cl.[2] C11C 1/00; C07C 51/00
U.S. Cl. 260—413 **14 Claims**

1. A process for preparing carboxylic acids which comprises bringing together in a reaction zone an olefin wherein greater than 50 mole percent of the olefin is an internal olefin, water and carbon monoxide in the presence of a cobalt catalyst and a promoter selected from the group consisting of pyridine, isoquinoline and alkyl pyridines having 1 to 4 carbon atoms in the alkyl chain, the molar ratio of promoter to catalyst being between about 5:1 and 15:1, at pressures from about 70 to about 300 kg/cm^2, at temperatures above 180° C. and below about 220° C.

4. A process of claim **1** wherein the olefin is a mixture of olefins having 10 to 20 carbon atoms.

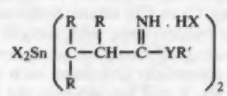
4,158,669

ORGANO-TIN COMPOUNDS

Hermann O. Wirth, Bensheim, and Hermann W. Wehner, Zwingenberg, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 27, 1978, Ser. No. 900,546
Claims priority, application Switzerland, May 6, 1977, 5708/77; Nov. 9, 1977, 13665/77
Int. Cl.[2] C07F 7/22
U.S. Cl. 260—429.7 **7 Claims**

1. An organo-tin compound of the general formula



wherein
X represents a chlorine, bromine or iodine atom,
Y represents an oxygen or sulphur atom,
R is selected from the group consisting of a hydrogen atom and alkyl, and R′ represents a hydrocarbon group of aliphatic or aromatic character, or said group substituted by a hydroxyl, thiol, alkoxy, alkylthio, carboxyl or carboalkoxy group.

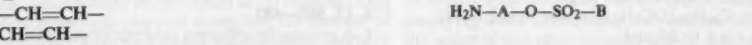
4,158,670

PROCESS FOR THE MANUFACTURE OF AROMATIC SULPHONIC ACID ESTERS OF AROMATIC AMINO-HYDROXY COMPOUNDS

Rolf Müller, Karben; Joachim Ribka, Offenbach am Main, and Horst Tappe, Dietzenbach, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 22, 1978, Ser. No. 879,852
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1977, 2717708
Int. Cl.[2] C07C 143/68
U.S. Cl. 260—456 A **14 Claims**

1. A process for the manufacture of esters of aromatic sulphonic acids and aromatic aminohydroxy compounds of the formula I



comprising reacting an aromatic aminohydroxy compound of the formula II

$$H_2N—A—OH \quad (II)$$

having a pK_a value of from 8.5 to 10.1, with a sulphochloride of the formula III

$$Cl—SO_2—B \quad (III)$$

wherein

A is phenylene, substituted phenylene, naphthylene are substituted naphthylene,

B is phenyl, substituted phenyl, naphthyl or substituted naphthyl, and both A and B are from —COOH and $—SO_3H$ substituents;

the reaction taking place in a reaction medium consisting essentially of water and a water-immiscible organic solvent for the sulphochloride, at a temperature of from 0° to 95° C., at a pH which is determined from and associated with the pK_a value of said aromatic aminohydroxy compound of formula II by the equation

$$pK_a - pH = 0.5 \text{ to } -1.5,$$

and in the presence of a phase transfer catalyst which is a quaternary ammonium salt or a phosphonium salt.

4,158,671

OXIDATION CATALYSTS AND PROCESS FOR PREPARING ANHYDRIDE FROM ALKANES

Bruno J. Barone, Houston, Tex., assignor to Denka Chemical Corporation, Houston, Tex.

Division of Ser. No. 793,752, May 4, 1977. This application Feb. 24, 1978, Ser. No. 881,032

Int. Cl.[2] C07C *51/54*

U.S. Cl. 260—546 **5 Claims**

1. A process for the partial oxidation of C_4 to C_{10} hydrocarbons to the corresponding anhydrides comprising contacting a feed of comprising C_4 to C_{10} alkane hydrocarbons in vapor phase at elevated temperatures, with oxygen and a catalyst composition consisting of vanadium, phosphorus and oxygen and a modifying component containing each of Cu, Mo, Ni, Co, Cr, Ce, Nd, Ba, Y and Sm, wherein the atomic ratio of vanadium:phosphorus:modifying component is 1:0.90 to 1.3; 0.033 to 0.4.

4,158,672

POLYFLUOROALKYLTHIO ALCOHOLS, ESTERS AND USEFUL COMPOSITIONS THEREFROM

Robert E. A. Dear, Mt. Kisco, N.Y., and Neal O. Brace, Wheaton, Ill., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 652,367, Jan. 26, 1976, abandoned. This application Dec. 23, 1977, Ser. No. 864,072

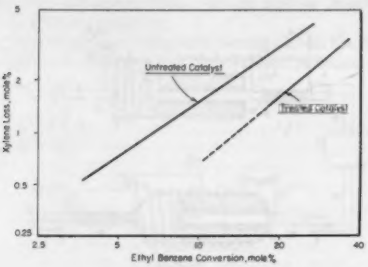
Int. Cl.[2] C07C *91/04*

U.S. Cl. 260—584 R **9 Claims**

1. A compound of the structure

$$R_f—R^1—SCH—R^2—O—R^4$$
$$\quad\quad\quad

clic methyl-substituted aromatic hydrocarbon compounds of from 8 to 10 carbon atoms contained in a feedstock also containing ethylbenzene which comprises contacting said feedstock in the vapor phase with a catalyst containing crystalline aluminosilicate zeolite characterized by a constant index within the approximate range of 1 to 12, said zeolite containing cations which are selected from the group consisting of hydrogen, hydrogen precursor and metal of Group VIII of the



Periodic Table of Elements, at a temperature of from about 600° F. to about 900° F., a pressure of from about 0 psig to about 500 psig, a hydrogen/hydrocarbon mole ratio of from 0 to about 10 and a weight hourly space velocity of from about 0.1 hr^{-1} to about 200 hr^{-1}, said catalyst being contacted with one or more basic nitrogen compounds or precursors thereof such that the ratio of nitrogen atoms/aluminum atom in the zeolite is from about 0.01 to about 1.0.

4,158,677

DIALKYLATION OF ALKYLBENZENE

Richard J. Lee, Downers Grove, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 13, 1978, Ser. No. 924,144
Int. Cl.² C07C *3/56*
U.S. Cl. 585—456 **10 Claims**

1. Process of dialkylating alkylbenzene which comprises contacting olefin and alkylbenzene at a temperature of 10° C. to 90° C. in the presence of a borontrifluoride carboxylic acid complex.

4,158,678

SEGMENTED POLYMERS CONTAINING FLUORINE AND IODINE AND THEIR PRODUCTION

Masayoshi Tatemoto, and Tsuneo Nakagawa, both of Ibaraki, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Jun. 30, 1977, Ser. No. 811,987
Claims priority, application Japan, Jun. 30, 1976, 51-78030
Int. Cl.² C08L *27/04, 27/10, 27/12*
U.S. Cl. 260—884 **46 Claims**

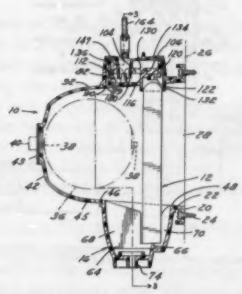
1. A segmented polymer comprising a sequence of two or more polymer segments, an iodine atom liberated from an iodinated compound bonded at a terminal position of said sequence and a fragment of the iodinated compound from which at least one iodine atom has been removed bonded at another terminal position of said sequence, whereby said sequence intervenes between said iodine atom and said fragment, wherein adjacent polymer segments are different in steric configuration or monomeric composition, at least the first polymer segment of said polymer segments containing fluorine and each polymer segment having a molecular weight of not less than 10,000 but at least one polymer segment having a molecular weight of not less than 30,000, the iodinated compound being a perhalohydrocarbon of 1 to 16 carbon atoms wherein at least one of the halogen atoms is an iodine atom but only one iodine atom is present on every two adjacent carbon atoms and the other halogen atoms consist of (1) fluorine atoms or (2) fluorine atoms and chlorine atoms but the number of chlorine atoms is not more than that of fluorine atoms and only one chlorine atom is present on one carbon atom, and which may have an oxygen linkage (—O—) between any two carbon atoms and/or include additionally $—CF_2H$ or $=CF_2$, and each of the polymer segments being constituted with the units of the monomer(s) selected from the following Groups (A) and (B), the said Group (A) consisting of fluorine-containing unsaturated polymerizable monomers of the formula $CF_2=CXY$ wherein X is a hydrogen atom or a fluorine atom, and in the case of X being a hydrogen atom Y is a hydrogen atom, and in the case of X being a fluorine atom Y is a hydrogen atom, a chlorine atom, a fluorine atom, a trifluoromethyl group, a difluoromethyl group, a perfluoroalkoxy group of 1 to 3 carbon atoms, a group of the formula $—(CF_2)_mCOOM$ in which m is an integer of 0 to 3 and M is hydrogen, sodium or potassium, or a group of the formula $—(OCF_2)_p—(OCF_2CF_2)_q—(OCF_2CF(CF_3))_r—Z$ in which Z is —COF, —COOM, $—SO_2F$ or $—SO_3M$, M being as defined above, and p, q and r are each an integer of 0 to 3 but at least one of them is not zero, and the said Group (B) consisting of unsaturated polymerizable monomers of 2 to 8 carbon atoms containing no fluorine atoms.

4,158,679

WATER DISTRIBUTOR TROUGH PRIMARILY FOR A WARM AIR FURNACE MOUNTED HUMIDIFIER

Richard J. Yeagle, Hartland, Mich., assignor to General Filters, Inc., Novi, Mich.

Filed Feb. 22, 1978, Ser. No. 879,845
Int. Cl.² B01F *3/04*
U.S. Cl. 261—106 **9 Claims**



1. An air treating apparatus comprising a housing, an evaporator pad mounted in said housing, water distribution means disposed above said evaporator pad for providing a substantially uniformly distributed flow of water to said evaporator pad, said water distribution means comprising an elongated rectangular tray having a bottom wall and upright side and end walls, a sump provided in said bottom wall adjacent one of said side walls and spaced from the other side wall and from said end walls, the bottom of said sump being at a lower elevation than the remaining portion of said bottom wall, an overflow rim at the upper edge of said sump extending from one portion of said one side wall around the upper edge of said sump to another portion of said one side wall, internal upright wall elements secured to said overflow rim and being spaced from said sump to define with said sump and with said one side wall a water reservoir, said tray having a plurality of longitudinally spaced apertures outside of said reservoir along said other side wall, means providing channels from said internal wall elements to said respective apertures, metering passages in said internal wall elements respectively placing said channels in communication with said water reservoir and said overflow rim, a cover secured over said tray and provided with an elongated tubular spout opened at both ends, said spout having its bottom edge extending into the sump of said tray, means for supplying water to said sump and reservoir through said spout, the water in said sump rising to a level at or above the bottom

edge of said tubular spout resulting in the formation of a seal which prevents air movement out of said reservoir through said spout, the water thereafter rising in said reservoir and overflowing said rim into said channels and apertures.

4,158,680

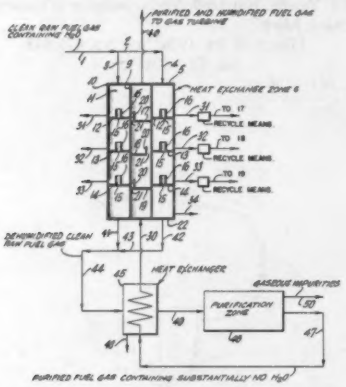
PRODUCTION OF PURIFIED AND HUMIDIFIED FUEL GAS

Rodney McGann, Santa Cruz, Calif., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 735,926, Oct. 27, 1976, Pat. No. 4,075,831. This application Jul. 22, 1977, Ser. No. 817,951

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—149 **3 Claims**



1. An indirect gas to gas heat exchanger comprising a closed vertical inner cylinder and a closed vertical coaxial outer cylinder, spacing means to provide an annular passage between said cylinders, said annular passage being bounded by the outer wall of said inner cylinder and the inner wall of said outer cylinder, said spacing means comprising a series of vertically spaced horizontal annular trays in said annular passage, a plurality of circular openings in each of said trays, an open-ended vertical cylindrically shaped dam with its lower end sealed around each of said openings and in communication therewith, a series of water distribution means vertically spaced in said inner cylinder, means for recycling water which collects on each annular tray to a corresponding water distribution means in said inner cylinder, inlet and outlet means connected respectively near the top and bottom of said annular passage for introducing clean raw fuel gas containing H_2O into the top of said annular passage and removing dehumidified clean raw fuel gas from the bottom of said annular passage; and inlet and outlet means connected respectively near the bottom and top of said inner cylinder for respectively introducing a purified fuel gas containing substantially no H_2O into the bottom of said inner cylinder and removing purified and humidified fuel gas from the top of said inner cylinder; wherein the gas stream passing up through said inner cylinder cools the gas stream passing down through said annular passage to a temperature below the dew point and water condenses out of the gas stream in said annular passage and collects on said annular trays.

4,158,681

SINTERING NUCLEAR FUEL PELLETS

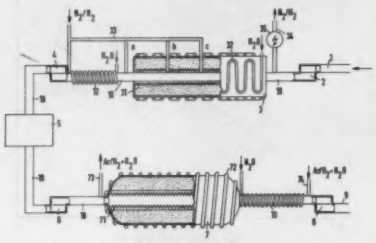
Peter Funke, Rodenbach, Fed. Rep. of Germany, assignor to ALKEM GmbH, Hanau, Fed. Rep. of Germany

Filed Mar. 14, 1977, Ser. No. 777,129

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611750

Int. Cl.[2] G21C *21/00*

U.S. Cl. 264—0.5 **17 Claims**



1. Method for sintering nuclear fuel pellets selected from the group consisting of nuclear fuel oxides and mixtures of nuclear fuel oxides having oxygen in stoichiometric excess of the dioxide in a reducing furnace atmoshpere, which comprises

(a) passing the nuclear fuel pellets having a stoichiometric excess of oxygen through a heated reduction furnace with a reducing atmosphere to effect reduction of at least substantially all said oxygen in stoichiometric excess of the dioxide,

(b) regulating the residence time of said nuclear fuel oxides in said reducing furnace to produce said reduced nuclear fuel oxides,

(c) cooling said reduced nuclear fuel oxides,

(d) passing said cooled-down nuclear fuel oxides to an intermediate station,

(e) subsequently passing said cooled-down nuclear fuel oxides through a separate sintering furnace, and

(f) independently regulating the residence time of the nuclear fuel oxides passing through the sintering furnace to effect sintering of the nuclear fuel pellets.

4,158,682

CONTROL OF CARBON BLACK DENSIFICATION

Charles R. Price, Macon, Ga.; Jimmy J. Hines, Borger, and Ronald L. Howell, Baytown, both of Tex., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 698,450, Jun. 21, 1976, abandoned, which is a continuation of Ser. No. 574,656, May 6, 1975, abandoned, which is a continuation of Ser. No. 316,968, Dec. 20, 1972, abandoned. This application Sep. 19, 1977, Ser. No. 834,853

Int. Cl.[2] B01J *2/10*

U.S. Cl. 264—40.4 **1 Claim**

1. A method of increasing the pour density of carbon black without adversely altering its properties of 300% modulus, tensile strength, abrasion resistance, and pH when compounded in an elastomeric substance, which comprises:

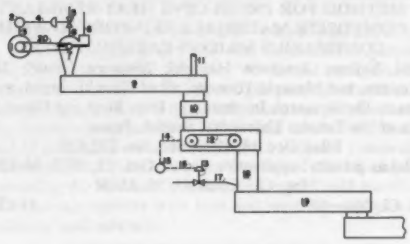
(a) flowing at a constant rate into a curved herringbone patterned screen-type motor-driven micropulverizer a fluffy dry carbon black which was manufactured by the incomplete combustion of hydrocarbons;

(b) micropulverizing the carbon black within the micropulverizer;

(c) simultaneously adding a wetting agent to the black in the micropulverizer in the amount of 10–50% by weight of the wetted carbon black;

(d) measuring the power requirements of the motor-driven micropulverizer;

(e) relaying the power requirements to a damped inverse-proportioned controller;
(f) generating pneumatic signals in the controller in inverse proportion to the power requirement signals;
(g) conveying said pneumatic signals to a pneumatically actuated valve in the supply line of said wetting agent to maintain a constant ratio of carbon black to wetting agent in the micropulverizer;
(h) conveying said pulverized wetted carbon black to an air lock chamber containing an air pressure relief valve;
(i) passing said carbon black through said air chamber onto a weigh-belt conveyor;
(j) continuously conveying said wetted carbon black on said weigh-belt conveyor to a carbon black pelletizer;



(k) simultaneously weighing the wetted carbon black contained on said weigh-belt conveyor;
(l) converting said weigh measurements into weight measurement signals;
(m) directing said weight measurement signals in a feed-forward loop to a direct-proportional controller;
(n) generating signals in said controller directly proportional to said weight measurement signals;
(o) supplying wetting agent through a motor valve to the pelletizer in the amount of 10% to 60% by weight of the wetted black;
(p) varying the flow through said motor valve using said generated signals from said controller; and
(q) pelletizing said carbon black in said pelletizer, said carbon black pellets having increased pour density.

4,158,683

PROCESS FOR OBTAINING FILMS AND BLOCKS OF CELLULOSE ACETATE PARTICULARLY FOR RAPID AND PREPARATIVE ANALYTICAL ELECTROPHORESIS AND FOR IMMUNO-TECHNIQUES

Giovan B. Del Campo, Via Gustavo Modena, 24, Milan, Italy (20129)

Continuation-in-part of Ser. No. 70,897, Sep. 9, 1970, abandoned. This application Apr. 30, 1973, Ser. No. 355,994
Claims priority, application Italy, Apr. 28, 1970, 24029 A/70
The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.
Int. Cl. B29d *7/02*
U.S. Cl. 264—41 **2 Claims**

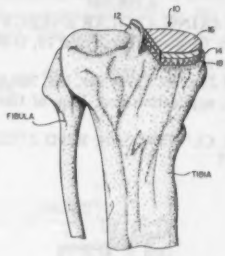
1. In a process for preparing films and blocks suitable for electrophoresis purposes, consisting essentialy of cellulose diacetate aqueous gel, which process comprises dissolving the cellulose diacetate in acetone, casting the solution thus obtained to form a film, evaporating at least a portion of said acetone, and immersing the cast film in water, the improvement which comprises varying the water content of the aqueous gel by dissolving said cellulose diacetate in a first mixture comprising acetone and ethylene-glycol-monoethyl ether in a ratio by volume of about 3:2; adding under stirring to the cellulose diacetate solution a second mixture comprising acetone and ethylene-glycol-monoethyl ether in a ratio by volume of about 1:5, thereby obtaining a swollen mass; adding under stirring to said swollen mass an amount of formamide in the range of 3–20% by weight based on the swollen mass; and thereafter subjecting the swollen mass to casting, evaporating and water-immersing steps, thus obtaining the film or block of cellulose diacetate aqueous gel; and wherein each step of the process is carried out at room temperature.

4,158,684

METHOD OF MAKING CERAMIC PROSTHETIC IMPLANT SUITABLE FOR A KNEE JOINT

Jerome J. Klawitter, Clemson, S.C., and Nazir A. Bhatti, Augusta, Ga., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 606,630, Aug. 21, 1975, Pat. No. 4,000,525. This application Dec. 13, 1976, Ser. No. 750,087
Int. Cl.² C04B *33/34*
U.S. Cl. 264—43 **5 Claims**



1. The method of fabricating a prosthesis having a controlled pore structure in a first layer of high alumina material laminated to a dense second layer of the same high alumina material, comprising the steps of
(a) mixing a powdered batch of 300 grams of high aluminum oxide material having an aluminum oxide weight percent of 96 with 135 cc of a 3.5 weight percent polyvinyl alcohol solution to produce a viscous slip;
(b) adding a foaming agent to the slip and thoroughly mixing them together;
(c) adding a catalyst to the slip to control the decomposition of the foaming agent;
(d) infiltrating the slip into a high porosity, fully reticulated, open interconnecting pore, flexible ester polymeric sponge to allow said foaming agent to decompose;
(e) drying the resultant material at room temperature after the foaming operation;
(f) producing a planar surface on said first porous layer;
(g) fabricating said dense second layer from a powdered batch of high aluminum oxide material having an oxide weight percent of 96 by compacting said last powdered batch at 5000 psi;
(h) placing an aqueous slurry of the same high aluminum oxide composition between said planar surface of said first layer and said dense compacted second layer to produce a laminate;
(i) drying the resultant product; and
(j) sintering the dried laminate at a temperature of about 1600° C. for four hours.

4,158,685

FOAMED INSULATION REFRACTORY

Joseph S. Masaryk, Castro Valley, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Mar. 16, 1978, Ser. No. 887,088
Int. Cl.² C04B *43/00*
U.S. Cl. 264—43 **9 Claims**

1. In the method of making an insulating refractory shape by: (a) preparing a slip of water, deflocculating agent, finely divided solid refractory particles, and binder; (b) preparing a

foam of water, air, and foaming agent; (c) admixing the slip and the foam to produce a foamed slurry; (d) casting the slurry into molds; (e) curing and (f) drying the cast pieces so formed; and (g) firing the pieces, the improvement wherein: (1) the slip consists essentially of at least 7.5% cement, from 0 to 50% clay, the balance of the solid ingredients being refractory aggregate all of which passes a 28 mesh screen, all percentages being by weight and based on the total weight of dry solid ingredients, and sufficient water to produce, when mixed with the foam, a foamed slurry having a viscosity of from 1000 to 30,000 centipoises; (2) the foam has a density of not over about 5 pcf; (3) the slip and the foam are admixed in the proportion of from 0.25 volume to 3 volumes of foam for each volume of slip; (4) the cast foamed slurry is cured at a temperature of not over about 72° F. for from 16 to 24 hours and then (5) dried at a temperature of not over about 200° F.

4,158,686

METHOD OF MAKING A SOLAR ENERGY COLLECTOR

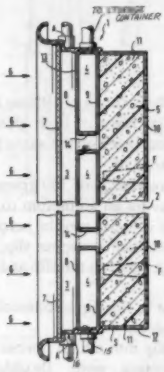
Alfred Boeckmann, Geigenbergerstrasse 19, D-8000 Munich 71, Fed. Rep. of Germany

Filed Jun. 25, 1976, Ser. No. 700,052

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1975, 2529001

Int. Cl.² B29C *5/04*; B29D *27/00*

U.S. Cl. 264—45.7 **13 Claims**



1. A method for producing a solar energy converter adapted for receiving the sun's rays on a solar side thereof and having at least one heat exchange medium flow passage defined by a first closed container having first and second generally planar wall members disposed transversely with respect to incident sun rays and circumferential side wall members connecting said first and second wall members around the circumference thereof, said first and second wall members being substantially parallel and spaced apart in the direction of the incident sun rays with said first wall member facing the solar side of the converter, at least one insulation chamber contiguous to said first closed container on the side of said second wall member, and a self-supporting unitary hollow structure having side walls and a bottom wall for containing said first closed container and said insulation chamber, wherein the side and bottom walls of said hollow structure and said first wall member of said first closed container define a second closed container enclosing therewithin at least one flow passage and at least one insulation chamber, said method comprising the steps of:

(a.) forming said first closed container in the form of a generally hollow body including said spaced, parallel and generally planar first and second wall members and said circumferential side wall members, enclosing therewithin at least one of said heat exchange medium flow passages;

(b.) positioning said first closed container in a rotational mold with the side wall members of said first closed container being contiguous to the sides of the mold; and (c.) rotationally casting a unitary self-supporting hollow structure having side walls and a bottom wall around said first closed container, thereby bonding the circumferential side walls of said first closed container to the side walls of said self-supporting hollow structure, thereby defining a second closed container between said first wall member of said first closed container and the side and bottom walls of said self-supporting hollow structure, said second closed container including said flow passage between said first and second wall members as well as an insulation chamber between said second wall member and the bottom wall of said self-supporting hollow structure.

4,158,687

METHOD FOR PRODUCING HEAT-RESISTANT COMPOSITE MATERIALS REINFORCED WITH CONTINUOUS SILICON CARBIDE FIBERS

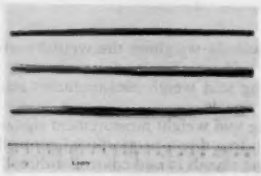
Seishi Yajima; Josaburo Hayashi; Mamoru Omori; Hideo Kayano, and Masaaki Hamano, all of Ohnuki, Japan, assignors to The Research Institute For Iron, Steel and Other Metals of the Tohoku University, Sendai, Japan

Filed Oct. 18, 1976, Ser. No. 733,623

Claims priority, application Japan, Oct. 27, 1975, 50-128297

Int. Cl.² C04B *35/56, 35/58*

U.S. Cl. 264—60 **11 Claims**



1. A method for producing heat-resistant composite materials reinforced with continuous silicon carbide fibers, which comprises forming a powdery ceramics matrix having an average grain size of smaller than 100 μm and continuous silicon carbide fibers and obtained by baking spun fibers of an organosilicon high molecular weight compound into a composite, and pressing and heating said composite into a sintered composite.

4,158,688

SACRIFICIAL BINDERS FOR MOLDING PARTICULATE SOLIDS AND THE MOLDING THEREOF

Robert A. Pett, Franklin; S. Burhan A. Qaderi, Westland, and Ronald J. Tabar, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 644,400, Jan. 7, 1976, abandoned. This application Jun. 27, 1977, Ser. No. 810,458

Int. Cl.² C04B *35/64*

U.S. Cl. 264—63 **11 Claims**

1. The method of making a sinterable molding of particulate sinterable particles which comprises mixing about 30 to about 70 volume percent of sinterable particulate solids with about 70 to about 30 volume percent of an organic sacrificial binder which comprises an intimate mixture of about 10 to about 90 parts by weight of resinous material and about 90 to about 10 parts by weight of a plasticizer for said resinous material wherein

(1) said resinous material is a block polymer having the structural formula

$$X—B(AB)_{\eta A}]_{\eta'}$$

wherein "η" is 0 or a positive integer, X is a linking group, A or B, "η'" is a positive integer greater than 2, "A" is a linear or branched polymer that is glassy or crystalline at 20°–25° C. and has its softening point in the range of about 80° C. to about 250°

C. and "B" is a polymer of different chemical composition than A that behaves as an elastomer at temperatures between 5° C. below the softening point of A and about 120° C. above the softening point of A; and

(2) said plasticizer is selected from the group consisting of

(a) an oil at least 75 percent by weight of which boils in the range of about 550° F. to about 1038° F., has viscosity at 210° F. in the range of about 30 to about 220 Saybolt Universal Seconds and aniline point in the range of about 170° F. to about 255° F.

(b) a wax melting at a temperature in the range of about 130° F. to about 170° F. at least 75 percent by weight of which boils at temperatures in the range of about 600° F. to about 900° F., and

(c) an oil in accordance with (a) and a wax in accordance with (b)

and wherein 0 to between 49 and 50 weight percent of said block polymer is replaced by a first replacement polymer meeting the limitations of polymer "A" in said structural formula, and 0 to between 49 and 50 weight percent of said block polymer is replaced with a second replacement polymer meeting the limitations of polymer "B" in said structural formula, the sum of said replacements of said block polymer comprising in combination less than 50 weight percent of said block polymer, molding the resultant mixture, driving off said sacrificial binder from said mixture with heat and sintering said particulate solids of said mixture.

4,158,689

MOLDING PARTICULATE SOLIDS AND SACRIFICIAL BINDERS THEREFOR

Robert A. Pett, Franklin; V. Durga Nageswar Rao, Bloomfield Township, Oakland County, and S. Burhan A. Qaderi, Westland, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 644,779, Jan. 7, 1976, abandoned. This application Jun. 27, 1977, Ser. No. 810,464

Int. Cl.[2] C04B *35/64*

U.S. Cl. 264—63 **11 Claims**

1. The method of making a sinterable molding of particulate sinterable particles which comprises mixing about 30 to about 70 volume percent of sinterable particulate solids with about 70 to about 30 volume percent of an organic sacrificial binder which comprises an intimate mixture of about 10 to about 90 parts by weight of resinous material and about 90 to about 10 parts by weight of a plasticizer for said resinous material wherein

(1) said resinous material is a block polymer having the structural formula AB —AB—$_\eta$ A, wherein "η" is 0 or a positive integer, "A" is a linear or branched polymer that is glassy or crystalline at 20°-25° C., has its softening point in the range of about 80° to about 250° C. and "B" is a polymer different than A that behaves as an elastomer at temperatures between about 15° C. below the softening point of A and about 100° C. above the softening point of A, and

(2) said plasticizer is selected from the group consisting of

(a) an oil at least 75 percent by weight of which boils in the range of about 550° F. to about 1038° F., has viscosity at 210° F. in the range of about 30 to about 220 Saybolt Universal Seconds and an aniline point in the range of about 170° F. to about 255° F.

(b) a wax melting at a temperature in the range of about 130° F. to about 170° F. at least 75 percent by weight of which boils at temperatures in the range of about 600° F. to about 900° F., and (c) an oil in accordance with (a) and a wax in accordance with (b)

and wherein 0 to between 49 and 50 weight percent of said block polymer is replaced by a first replacement polymer meeting the limitations of polymer "A" in said structural formula, and 0 to between 49 and 50 weight percent of said block polymer is replaced with a second replacement polymer meeting the limitations of polymer "B" in said structural formula, except that said second replacement polymer behaves as an elastomer at temperatures between about 5° C. below the softening point of "A" of said block polymer and about 90° C. above the softening point of "A" of said block polymer, the sum of said replacements of said block polymer comprising less than 50 weight percent of said block polymer, molding the resultant mixture, driving off said sacrificial binder from said mixture with heat and sintering said particulate solids of said mixture.

4,158,690

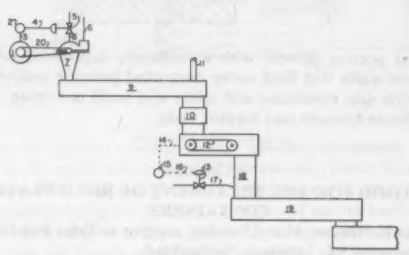
CONTROL OF CARBON BLACK DENSIFICATION

Charles R. Price, Macon, Ga.; Jimmy J. Hines, Borger, and Ronald L. Howell, Baytown, both of Tex., assignors to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 834,853, Sep. 19, 1977, which is a continuation of Ser. No. 698,450, Jun. 21, 1976, abandoned, which is a continuation of Ser. No. 574,656, May 6, 1975, abandoned, which is a continuation of Ser. No. 316,968, Dec. 20, 1972, abandoned. This application Feb. 21, 1978, Ser. No. 879,321

Int. Cl.[2] B01J *2/12*

U.S. Cl. 264—115 **4 Claims**



1. A method of increasing the pour density of carbon black, comprising:

(a) flowing a fluffy, dry, deflocculated carbon black into a micropulverizer;

(b) micropulverizing said fluffy carbon black while simultaneously adding a wetting agent to said carbon black;

(c) removing said wetted carbon black to a pelletizer;

(d) pelletizing said carbon black in said pelletizer while adding additional wetting agent to form pellets of said carbon black; and

(e) recovering said carbon black pellets, said carbon black pellets having increased pour density.

4,158,691

METHOD FOR PRESSING ARTICLES SUCH AS PLATES FROM PULVERULENT PORCELAIN COMPOSITION

Rolf E. R. Schubart, Kochel am See, Fed. Rep. of Germany, assignor to Dorst-Keramikaschinen-Bau Otto Dorst U. Dipl.-Ing. Walter Schlegel, Kochel am See, Fed. Rep. of Germany

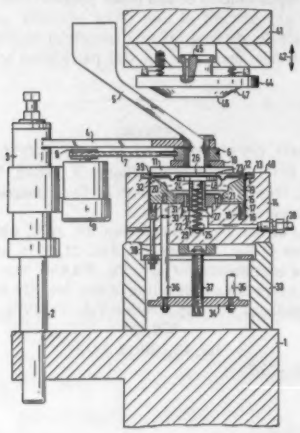
Division of Ser. No. 595,235, Jul. 11, 1977, Pat. No. 4,043,724. This application May 4, 1977, Ser. No. 793,627

Int. Cl.[2] B29C *3/00, 1/12;* B28B *1/00, 7/06*

U.S. Cl. 264—314 **7 Claims**

1. In the method of forming a concave plate having a foot from pulverulent porcelain material, the steps comprising: providing a distendable, elastic membrane having a depending upwardly opening pocket therein, supporting said membrane over a support body to form a generally flat upper surface, said membrane and said support body defining a space, covering the upper surface of said membrane to a uniform depth with said material, forcing said membrane by means of a mold shaped to form the upper surface of the article towards said support body causing said membrane to assume the concave shape of the article while simultaneously resiliently supporting the membrane with a support from beneath within said space,

said step of resiliently supporting the membrane including the step of pressurizing said space with a fluid under controlled pressure, and engaging the undersurface of said membrane at a



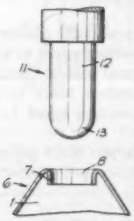
central portion thereof with a resiliently depressible, rigid support while said fluid under controlled pressure resiliently supports said membrane and while said mold is forcing said membrane towards said support body.

4,158,692

METHOD FOR THE TREATMENT OF RIGID PLASTIC CONTAINERS

Ingvar E. Nilsson, Akarp, Sweden, assignor to Tetra Pak Developpement SA, Lausanne, Switzerland

Filed Apr. 4, 1977, Ser. No. 784,592
Claims priority, application Sweden, Apr. 20, 1976, 7604510
Int. Cl.[2] B29C *17/00*
U.S. Cl. 264—320 **8 Claims**



1. A method of cold-working a substantially bottle-shaped container having a neck portion, an opening adjacent thereto and being constructed of a plastic material, said method comprising the steps of:

(a) maintaining the temperature of the container below the softening temperature of the plastic material;

(b) maintaining the neck portion in an unrestrained state to permit expansion of said neck portion;

(c) inserting a mandrel into the opening thereby increasing the size of the opening and the adjacent neck portion;

(d) maintaining the mandrel in the opening for a period of time; and

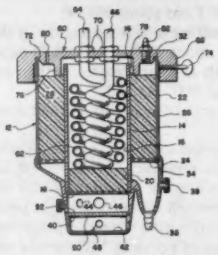
(e) withdrawing the mandrel from the opening, wherein the size and shape of the mandrel, the rate of insertion of the mandrel into the opening and the period of time the mandrel is maintained in the opening are selected to orient the plastic material of the neck portion in a circumferential direction to thereby obtain biaxial orientation and to increase the resistance of the plastic material of the neck portion to mechanical stresses without the formation of cracks.

4,158,693

BLOOD OXYGENATOR

Charles C. Reed; Denton A. Cooley, both of Houston, and Russell G. Sharp, Sugar Land, all of Tex., assignors to Texas Medical Products, Inc., Houston, Tex.

Filed Dec. 29, 1977, Ser. No. 865,476
Int. Cl.[2] A61M *1/03*
U.S. Cl. 422—46 **7 Claims**



1. A blood oxygenator comprising:

a disposable receptacle having an open end and comprising an oxygenating chamber, a defoaming chamber adjacent to at least a portion of said oxygenating chamber, means for communicating blood flow from said oxygenating chamber to said defoaming chamber, means disposed within said defoaming chamber for removing bubbles from the blood passing therethrough, an arterial reservoir, and means for communicating blood flow from said defoaming chamber to said arterial reservoir;

a cover removably mounted on the open end of said receptacle, said cover being constructed of a reusable sterilizable material; and

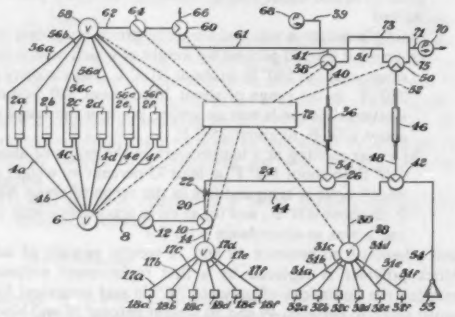
means for exchanging heat with the oxygenated blood passing through said oxygenating chamber, said means being constructed of sterilizable material to permit its reuse and comprising a downwardly extending member attached to said cover, said member having sufficient length so as to be essentially nested within said oxygenating chamber when said cover is attached to the receptacle.

4,158,694

AUTOMATED APPARATUS FOR TESTING SUSTAINED RELEASE DRUGS

Dennis E. Bischoff; Gary R. Dickinson; Michael E. Hinshaw, and Robert M. Brooker, all of Indianapolis, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 30, 1978, Ser. No. 891,663
Int. Cl.[2] G01N *1/10, 1/14*
U.S. Cl. 422—81 **3 Claims**



1. An apparatus for automatically testing sustained release drugs which comprises:

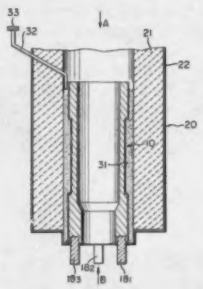
(a) at least one dissolution chamber having means for circulating liquid therethrough;
(b) agitating means contacting the contents of the dissolution chamber or moving the dissolution chamber itself during operation;
(c) a first flow path contacting said dissolution chamber and a buffer reservoir;
(d) a second flow path connecting said dissolution chamber and a fluid collection reservoir;
(e) a third flow path connecting said dissolution chamber and a wash reservoir;
(f) valving means for selectively activating and deactivating said first, second and third flow paths; and
(g) programming means for selectively operating said valving means whereby said first, second and third flow path are sequentially activated and deactivated according to a preselected program.

4,158,695

ELECTROTHERMAL FLUIDIZED BED FURNACE

Hiroshi Ishizuka, 19-2 Ebara 6-chome, Shinagawa-ku, Tokyo, Japan, and Yoshiaki Sugano, Hadano, Japan, assignors to Hiroshi Ishizuka, Tokyo, Japan

Filed Jun. 29, 1977, Ser. No. 811,392
Claims priority, application Japan, Jul. 1, 1976, 51-77011; Jul. 1, 1976, 51-77012
Int. Cl.[2] B01J *8/24;* H05B *3/62, 3/66*
U.S. Cl. 422—145 **13 Claims**



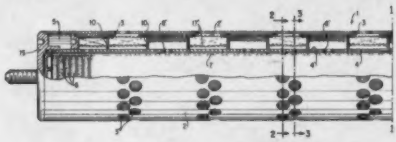
1. In an electrothermal fluidized bed furnace comprising a substantially cylindrical and upright inner furnace wall made of insulating refractory bricks, a fluid-tightly sealing outer furnace wall made of a metallic material and arranged around said inner furnace wall, a reactor tube mounted inside said inner furnace wall, means for receiving raw materials charged into said reactor tube through an upper open end thereof, means for receiving gases introduced into said reactor tube through a lower end thereof to form within said reactor tube a fluidized bed for the raw materials, and electrodes for supplying power to said reactor tube to heat the raw materials in the fluidized bed and cause therein a reaction thereof with the gases, the improvement in that said reactor tube is made of graphite and has a plurality of slits extending longitudinally from the lower end towards the upper end of said reactor tube so that a lower portion of the reactor tube is divided into a plurality of pairs or triplets of elongated parts each having a sector cross section, each of said slits being filled with an insulating refractory material, each of said elongated parts being provided with the electrode, and means for supplying power to at least one selected pair or triplet of said elongated parts through the corresponding electrodes to pass electric current and heat the selected elongated parts which are separated from each other by at least one intervening elongated part in which the corresponding electrode passes no electrical current.

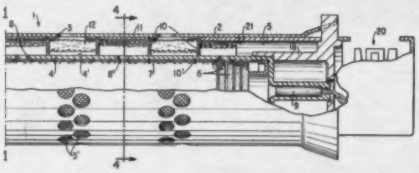
4,158,696

AIR CUSHION RESTRAINT INFLATOR ASSEMBLY

Raymond L. Wilhelm, Phoenix, Ariz., assignor to Talley Industries of Arizona, Inc., Mesa, Ariz.

Filed Sep. 28, 1977, Ser. No. 837,584
Int. Cl.[2] B01J *7/00;* B60R *21/08*
U.S. Cl. 422—166 **10 Claims**





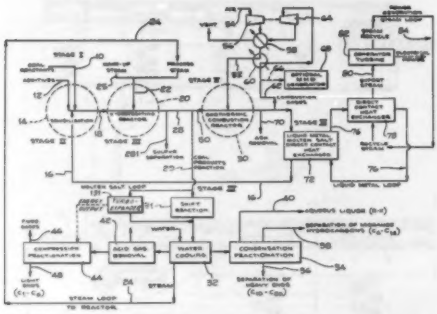
1. An air cushion restraint inflator assembly comprising:
(a) an elongated substantially cylindrical outer sleeve having a plurality of openings therein defining gas exit ports, the openings being divided into a plurality of narrow bands of openings separated from one another in an axial direction along the length of the outer sleeve by portions of the outer sleeve which do not define openings, each narrow band including a plurality of openings spaced apart circumferentially about the outer sleeve;
(b) an elongated substantially cylindrical inner sleeve mounted within and in generally coaxial relation to the outer sleeve and for containing a reactable gas-generating material, said inner and outer sleeves defining an annular region therebetween, said inner sleeve having a plurality of openings defining first filter chamber gas entrance ports segregated into a plurality of narrow bands of gas entrance ports, the bands of gas entrance ports being separated from one another in an axial direction by portions of the inner sleeve which do not define openings and interleaved with, and separated from the bands of gas exit ports in an axial direction, each narrow band including a plurality of gas entrance ports spaced circumferentially about the inner cylindrical sleeve;
(c) means for initiating reaction of the reactable gas generating material; and
(d) a plurality of annular side walls extending between the inner and outer sleeves and separated from one another in an axial direction to segment the annular region into a plurality of filter chambers, each annular side wall being positioned between a group of gas exit ports and a group of gas entrance ports thereby forming alternating:
(1) first annular filter chambers defined by adjacent pairs of annular side walls which have a group of gas entrance ports therebetween each first chamber including a first filter means, and
(2) second annular filter chambers defined by adjacent pairs of annular side walls which have a group of gas exit ports therebetween each second chamber including a second filter means, said second filter chambers communicating with said first filter chambers by means of annular side wall openings.

4,158,697

COAL TREATMENT APPARATUS

Frank B. Cramer, Mission Hills, Calif., assignor to Clean Energy Corporation, Burbank, Calif.

Division of Ser. No. 644,712, Dec. 29, 1975, Pat. No. 4,104,056, which is a division of Ser. No. 512,539, Oct. 7, 1974, Pat. No. 3,966,583. This application Oct. 26, 1976, Ser. No. 735,818
Int. Cl.[2] B01J *1/00, 8/08;* C10J *3/20;* F28D *19/00*
U.S. Cl. 422—189 12 Claims



1. Apparatus for the treatment of coal or like carbonaceous solid fuel reactant for the co-production of hydrocarbons and heat energy, comprising a first reactor, means to introduce steam into said first reactor for hydrogenation of reactant therein, a second reactor, means to introduce an oxidizing gas into said second reactor for oxidation of reactant therein, a recirculating molten salt loop means communicating said first and second reactors, means to add said reactant to said molten salt loop for solution therein and for hydrogenation thereof within said first reactor and for combination of the reactant remainder in said second reactor, means to recover hydrogenation product comprising a hydrocarbons stream from said first reactor, and second, heat transfer loop means directly heat exhanging said molten salt with an inert, different density, high specific heat, immiscible liquid heat transfer medium commingled therewith in relatively moving relation to recover heat energy from said molten salt loop.

4,158,698

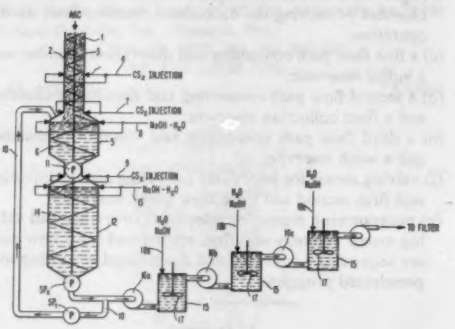
APPARATUS FOR CONTINUOUS XANTHATION AND PRODUCTION OF VISCOSE SPINNING SOLUTION

Charles J. Geyer, Jr., Berwyn, and Ben E. White, Wayne, both of Pa., assignors to Fiber Associates, Inc., Berwyn, Pa.

Division of Ser. No. 610,419, Sep. 4, 1975, Pat. No. 4,037,039. This application Feb. 16, 1977, Ser. No. 769,179
Int. Cl.[2] B01J *1/00*
U.S. Cl. 422—189 11 Claims

1. In an apparatus for xanthating a continuous feed of alkali cellulose and producing a viscose spinning solution therefrom, the improvement which comprises:

a first chamber, said first chamber having means for continuously downwardly feeding shredded alkali cellulose through said chamber while sealing said chamber to prevent the escape of gases therefrom; means at the lower portion of said first chamber for introducing into said first chamber at a controlled rate an amount of carbon disulfide required to partially xanthate said cellulose, the height of said chamber being sufficient to allow an amount of said cellulose to be present to absorb and react with all of the carbon disulfide introduced; means for continuously removing said alkali cellulose from said first chamber prior to the completion of the reaction between said cellulose and said carbon disulfide and passing it to a second chamber; said second chamber including means for introducing an alkali hydroxide and means for introducing carbon



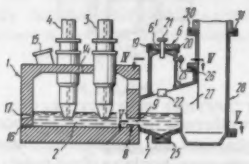
disulfide at a controlled rate so as to permit the further reaction of the xanthated alkali cellulose.

4,158,699

INSTALLATION FOR THE PRODUCTION OF YELLOW PHOSPHORUS

Semen I. Volfkovich, Vystavochny pereulok, 3, kv. 12, Moscow; Vladimir N. Belov, Bolsheokhtinsky prospekt, 3, kv. 305; Vadim A. Ershov, prospekt Veteranov, 105, kv. 29, both of Leningrad; Evgeny K. Rozenberg, Novokhoroshevskoe shosse, 31, korpus 2, kv. 36; Emmanuil I. Shipov, Izumrudnaya ulitsa, 50, kv. 134, both of Moscow, and Ljudmila V. Jumanova, Otdelny pereulok, 5a, kv. 13, Sverdlovsk, all of U.S.S.R.

Division of Ser. No. 601,468, Aug. 4, 1975, Pat. No. 4,056,601. This application Apr. 18, 1977, Ser. No. 788,431
Int. Cl.[2] B01J *1/00, 6/00;* C01B *25/01*
U.S. Cl. 422—189 9 Claims



1. An apparatus for the production of yellow phosphorus comprising:

means for preliminary melting of a phosphate-quartzite charge comprising burner means for substantially instantaneously melting the charge to form a thin flowing layer of melt, a melt collector, and means for discharging the thin flowing layer of melt into the melt collector where the thin flowing layer collects as a melt;

an electrothermal furnace adapted to hold a bath and having a plurality of electrodes mounted to extend into the bath and means for introducing a comminuted reducing agent into the electrothermal furnace;

means for providing liquid communication between the melt collector and the electrothermal furnace so the melt can flow from the melt collector to the electrothermal furnace, wherein the means for providing liquid communication defines a liquid seal between the furnace and the melt collector and wherein one of the electrodes is located opposite of the liquid seal to ensure direct action of the electrode from the collector and reliable operation of the seal.

4,158,700
METHOD OF PRODUCING RADIOACTIVE TECHNETIUM-99M

Hampar L. Karageozian, 25082 Morro Ct., Laguna Hills, Calif. 92653

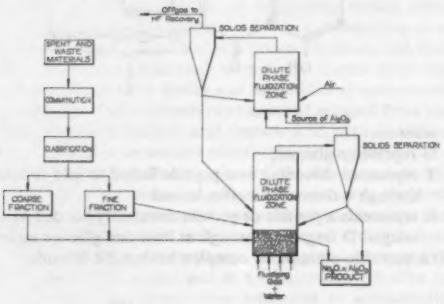
Continuation-in-part of Ser. No. 664,584, Mar. 8, 1976, abandoned. This application Mar. 14, 1978, Ser. No. 886,404
Int. Cl.[2] C01G *57/00*
U.S. Cl. 423—2 **6 Claims**

1. A method for producing Technetium-99m in a dry, particulate form comprising eluting an adsorbant chromatographic material containing Molybdenum-99 and Technetium-99m with a neutral solvent system comprising an organic solvent selected from the group consisting of acetone, methyl ethyl ketone, diethyl ketone, ethyl acetate and mixtures thereof and (a) about 0.1 to less than about 10% water or (b) from about 1 to less than about 70% of an aliphatic alcohol having 1–6 carbon atoms and separating the solvent system from the eluate whereby a dry, particulate residue is obtained containing Technetium-99m, said residue being substantially free of Molybdenum-99.

4,158,701
PYROHYDROLYSIS SYSTEM FOR PROCESSING FLUORINE-CONTAINING SPENT AND WASTE MATERIALS

John N. Andersen, Moraga, and Norman Bell, Livermore, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Nov. 6, 1978, Ser. No. 958,061
Int. Cl.[2] C01F *7/04*; C01B *7/22*
U.S. Cl. 423—119 **4 Claims**



1. A pyrohydrolysis process for the recovery of fluorine, aluminum and sodium values from spent and waste materials generated in electrolytic aluminum reduction facilities which comprises:

(a) comminuting the spent and waste materials and classifying the comminuted materials by size into coarse and fine fractions, wherein the coarse fraction consists of particles having a size in the range of about 1.3 to 5 mm and the fine fraction consists of particles of less than about 1 mm;

(b) providing a pyrohydrolysis reactor having a dense phase fluidized reaction zone and superimposed thereon at least one dilute phase fluidized reaction zone;

(c) charging to the dense phase fluidized zone a feed consisting of a mixture of the coarse fraction and a portion of the fine fraction and subjecting this feed in the dense phase fluidized zone to pyrohydrolysis in the temperature range of about 900° C. and 1300° C. in the presence of steam to generate an offgas containing HF and volatile sodium-containing reaction products which enter from the dense phase zone the superimposed dilute phase fluidized zone and a solid $Na_2O.xAl_2O_3$ clinker which is removed from the bed;

(d) charging to the first dilute phase fluidized zone as feed the residual fine fraction and subjecting this fraction to pyrohydrolysis in the presence of the volatiles from the dense phase zone and steam to form additional HF and volatile sodium-containing compounds in the offgas and solid $Na_2O.xAl_2O_3$ product;

(e) controlling the Na to Al mole ratio in both the dense and first dilute phase reaction zones between the limits of about 0.7 to 1.0;

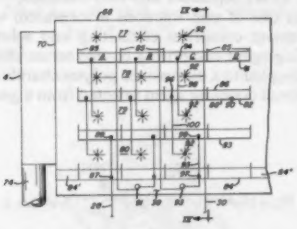
(f) separating the solid product from the offgas and introducing the solids-free offgas containing the HF and volatile sodium-containing reaction products into a second dilute phase fluidized zone where it is contacted with a finely divided source of Al_2O_3 having a particle size in the range of about 40 to 500 microns, the quantity of Al_2O_3 source being controlled so as to obtain an Na:Al mole ratio in the reaction zone within the limits of about 0.3 and 0.6, the source of Al_2O_3 being introduced to this zone to essentially complete conversion of the volatile sodium-containing compounds to HF and solid $Na_2O.xAl_2O_3$;

(g) separating the solids from the essentially sodium compound-free HF-containing offgas and recovering the HF from the offgas.

4,158,702
GAS CLEANSING MEANS

William E. Archer, Huntington Beach, Calif., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation of Ser. No. 490,807, Jul. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 243,618, Apr. 13, 1972, abandoned. This application Aug. 9, 1976, Ser. No. 712,625
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—210 **1 Claim**



1. A method of treating a horizontally flowing gas stream containing air pollutants with a scrubbing liquor including a reactant which absorbs at least a portion of said pollutants, comprising the steps of:

(a) contacting a downstream portion of said gas stream in an upper region of a first zone with a mist which includes a plurality of substantially vertically falling droplets of said scrubbing liquor whereby said droplets absorb a portion of said pollutants;

(b) collecting said absorbed polluted droplets in a first area within said first zone wherein said polluted droplets are reamalgamated;

(c) contacting said gas stream in a lower region of said first zone with a mist of droplets formed from said reamalgamated scrubbing liquor whereby said newly formed droplets absorb a portion of said pollutants;

(d) collecting said absorbed polluted droplets of step c in a second area within said first zone and below said first area wherein said polluted droplets are reamalgamated;

(e) contacting a portion of said gas stream upstream from said downstream portion in an upper region of a second zone with another mist of droplets formed from said reamalgamated scrubbing liquor from step d whereby said newly formed droplets absorb a portion of said pollutants;

(f) collecting said absorbed polluted droplets in a first area within said second zone wherein said polluted droplets are reamalgamated;

(g) contacting said gas stream in a lower region of said

second zone with a mist of droplets formed from said reamalgamated scrubbing liquor from step f whereby said droplets absorb a portion of said pollutants;

(h) collecting said absorbed polluted droplets of step g in a second area within said second zone and below said first area wherein said polluted droplets are reamalgamated; and

(i) repeating steps e through h with at least one additional said zone disposed upstream from said second zone so as to remove said pollutants from said gas stream under conditions wherein the freshest most reactant scrubbing liquor is applied to the furthest downstream zone of said gas stream having the least amount of pollutants and the least reactant scrubbing liquor being applied to the furthest upstream zone of said gas stream having the greater amount of pollutants.

4,158,703

T_3 UPTAKE TEST EMPLOYING COVALENTLY BOUND BOVINE SERUM ALBUMIN

Alan J. Polito, Costa Mesa, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

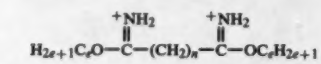
Continuation-in-part of Ser. No. 682,808, May 3, 1976, Pat. No. 4,081,245. This application Feb. 13, 1978, Ser. No. 877,043
Int. Cl.² G01N *33/16*; A61K *43/00*
U.S. Cl. 424—1 **22 Claims**

1. An improved T_3 uptake test procedure of the type wherein:

(a) a solution is contacted with labeled T_3 and a separating agent;

(b) serum bound labeled T_3 and separating agent bound labeled T_3 are separated into two fractions;

(c) at least one of said fractions is measured; wherein the improvement comprises contacting said solution with a separating agent comprising bovine serum albumin covalently coupled to a derivatized polysaccharide matrix by a bifunctional coupling agent selected from a group consisting of



wherein n is an integer from 1 to 6 and wherein e is an integer from 1 to 2.

4,158,704

PROCESS AND COMPOSITION FOR PERMANENT WAVING

Ronald W. Baer, New City, and Marvin E. Goldberg, Monsey, both of N.Y., assignors to Revlon Inc., New York, N.Y.

Continuation-in-part of Ser. No. 742,770, Nov. 18, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 892,744
Int. Cl.² A61K *7/09*
U.S. Cl. 424—72 **9 Claims**

1. A process for effecting the reducing step in permanent waving which comprises treating the hair with an aqueous solution containing from about 18 to 30% by weight of an ester of thioglycolic acid, said ester being selected from the group consisting of lower alkyl, hydroxy-lower alkyl and glyceryl esters, and having a pH of about 6.4 to 8.3, for about 1 to 35 minutes at a temperature from about 80° to 130° F., with the time and temperature parameters being selected as follows:

Concentration of Reducing Agent in % by weight	18–22	23–27	28–30	18–22	28–30
pH	6.4–7.0	7.1–7.7	7.8–8.3	7.8–8.3	6.4–7.0
Time in Minutes	3–35	2–33	1–30	2–33	2–33
Temp. in °F.	100–130	90–125	80–120	90–125	90–125

4,158,705

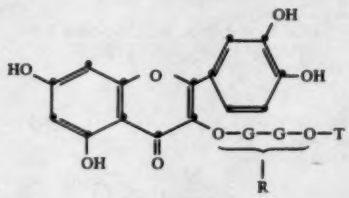
ANTIGEN-PROTEIN COMPLEX FOR BLOCKING ALLERGIC REACTIONS

Arthur Malley, Beaverton, Oreg., assignor to Research Corporation, New York, N.Y.

Division of Ser. No. 731,414, Oct. 12, 1976. This application Jul. 5, 1978, Ser. No. 922,222
Int. Cl.² A61K *39/36*
U.S. Cl. 424—91 **8 Claims**

1. A method of treating allergies comprising injecting into an individual an amount of a multivalent complex selected from the group consisting of:

(1) a complex consisting essentially of at least one antigen D fragment bonded to a protein or peptide having the formula:



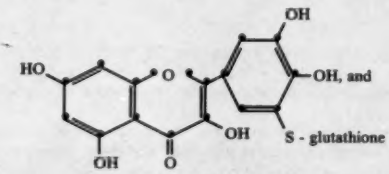
wherein:

G represents glucose;

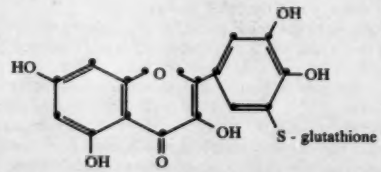
T represents threonine or a peptide linked to said structure through a threonine molecule; and

R represents a peptide or protein covalently bonded to said antigen D fragment through at least one glucose moiety,

(2) a quercitin-glutathione complex having the formula:



(3) a complex consisting essentially of at least one quercitin-glutathione complex having the formula:



covalently bonded to a protein or peptide by a peptide linkage through the glutathione moiety sufficient to inhibit antigen-induced hystamine release.

4,158,706

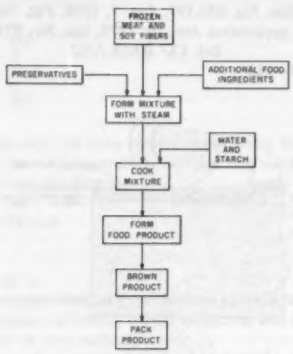
FOOD PRESERVATION

Thomas J. Ernst, Belleville, Ill.; Edward V. Oborsh, Ballwin, and Foppe E. Oreel, St. Louis, both of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 377,488, Jul. 9, 1973, abandoned. This application Jul. 25, 1977, Ser. No. 818,791

Int. Cl.[2] A23B *4/12*

U.S. Cl. 426—327 12 Claims



1. A method of producing a nutritionally and therapeutically beneficial pet food material having a long shelf life and resistance to bacterial and mold spoilage on storage under ambient conditions and in conventional packaging materials which are permeable to bacterial penetration comprising mixing nutritious, proteinaceous-farinaceous food sources comprising meat components which are ground in a frozen condition, and then subjected to a heat treatment to melt the frozen meat and partially cook it prior to addition of the additional components of the mixture, with a preservative material selected from the group consisting of succinic acid, fumaric acid, pyruvic acid or mixtures thereof in an amount effective to substantially reduce the initial bacterial contamination of the food components when subjected to heat, and effective to preserve the heat treated food from subsequent bacterial contamination and growth of storage under ambient conditions; adding a heat thickening agent to the mixture; heating the preservative treated mixture for a time and at a temperature effective to cooperate with the preservative treatment to substantially reduce bacterial contamination of the pet food and preserve the food from subsequent bacterial contamination and growth; and effective to heat set the thickening agent to form a moldable mixture; and subsequently forming the mixture into formed particles.

4,158,707

PARENTERAL PREPARATIONS

Hans Steffen, Arisdorf, and Dieter Schmidt, Basel, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 8, 1977, Ser. No. 813,913

Int. Cl.[2] A61K *31/33, 47/00*

U.S. Cl. 424—244 7 Claims

1. An aqueous pharmaceutical preparation suitable for parenteral administration comprising a benzodiazepine, a phosphatide and a micelle forming agent selected from the group consisting of cholic acid, deoxycholic acid, glycodeoxycholic acid, taurodeoxycholic acid, chenocleoxycholic acid, glycochenodeoxycholic acid. taurochenodeoxycholic acid, glycocholic acid, taurocholic acid and pharmaecutically acceptable salts thereof.

4,158,708

SPICE EXTRACT

Jacky Chiovini, Ecublens; Jean-Paul Marion, Mollie-Margot, and Siegfried Adamer, Lausanne, all of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Mar. 4, 1977, Ser. No. 774,640

Claims priority, application Switzerland, Mar. 9, 1976, 2896/76

Int. Cl.[2] A23L *1/221*

U.S. Cl. 426—650 20 Claims

1. A process for the production of an aromatic spice extract, which comprises:

(a) grinding a spice at low temperature, increasing the temperature of the ground spice to liberate an aromatic fraction A consisting of grinding gases, entraining the grinding gases by a stream of inert gas and collecting the aromatic fraction A by condensation,

(b) treating the ground spice with an apolar organic solvent so as to obtain an aromatic fraction B contained in this apolar solvent,

(c) treating the ground spice with at least one polar solvent so as to obtain an aromatic fraction C contained in this polar solvent, and

(d) combining aromatic fractions A, B and C to produce the aromatic spice extract.

4,158,709

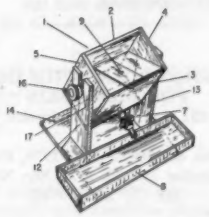
METHOD FOR COLLECTING HISTOLOGIC MATERIAL

Peter J. Tsaknis, Mt. Airy, Md., and Virginia J. Lux, Dover, Del., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 26, 1978, Ser. No. 900,389

Int. Cl.[2] G01N *31/00*

U.S. Cl. 427—2 1 Claim



1. A method for depositing histologic material on a slide located in a container which contains a liquid comprising the steps of:

a. placing the slide in the liquid;

b. supporting the slide diagonally;

c. floating the histologic material on the liquid;

d. rotating the container to a position where the slide is horizontal and the histologic material is floating over the slide; and

e. removing the liquid from the container thereby allowing said floating histologic material to settle upon the slide.

4,158,710

METHOD OF PREPARATION OF THE SURFACES OF PRODUCTS MADE OF IRON ALLOYS, PRECEDING THE PROCESS OF HOT-DIP ALUMINIZING

Adam Gierek; Lech Bajka, and Danuta Adamczyk, all of Katowice, Poland, assignors to Politechnika Slaska im. Wincentego Pstrowskiego, Gliwice, Poland

Filed Dec. 29, 1977, Ser. No. 865,780

Claims priority, application Poland, Dec. 31, 1976, 194998

Int. Cl.[2] C23C *1/08, 1/12*

U.S. Cl. 427—310 6 Claims

1. A method for treatment of a work-piece made of an iron

alloy, said method comprising the steps of mechanically cleaning said work-piece, degreasing and washing the cleaned work-piece, etching the washed work-piece in an aqueous solution comprising 0.5–1.0% by weight of citric acid and 16–24% by weight of hydrochloric acid at a temperature of 15°–30° C. for 1–20 minutes, neutralizing the etched work-piece in an aqueous solution of ammonia having a concentration not exceeding 1% by weight at a temperature of 15°–25° C. for not less than 1 minute, washing the neutralized work-piece in water at a temperature not exceeding 35° C. for not less than 1 minute, dipping the neutralized washed work-piece in an agitated flux solution comprising 1.8–2.5% by weight of potassium fluoride, 0.8–1.5% by weight of sodium fluoride, and 1.5–3.0% by weight of potassium fluorozirconate at a temperature of 40°–80° C. for at least 2 minutes, and drying the fluxed work-piece.

4,158,711

HOT KNIFE WELDS IN THERMOPLASTIC STRAP

Russell J. Gould, Mount Prospect, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed May 4, 1977, Ser. No. 793,445
Int. Cl.[2] B32B *3/26*
U.S. Cl. 428—57 **9 Claims**

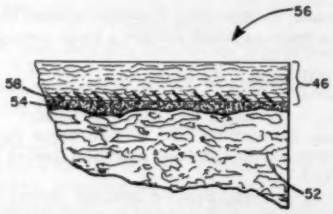
1. An improved weld joining the overlapping end portions of a thermoplastic polymeric strap comprising at least one fused interfacial region which includes an annular mass defining therewithin at least one elongated cavity; at least two of said cavities being present within said region and collectively spanning the width of the strap.

4,158,712

COMPOSITION BOARD WITH IMPROVED POLYMERIC SKIN

Alfredo Degens, 952 Ave. Delfim Moreira, Rio de Janeiro, Brazil

Division of Ser. No. 693,198, Jun. 7, 1976, Pat. No. 4,083,743.
This application Jan. 20, 1978, Ser. No. 871,148
Int. Cl.[2] B32B *7/02*
U.S. Cl. 428—212 **14 Claims**



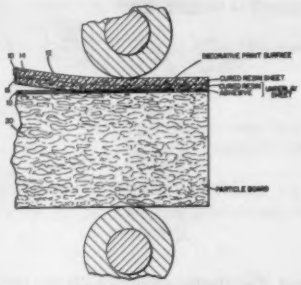
1. A thin nonfrangible sheet material suitable for use as a surface covering, which material comprises a fibrous sheet material having a basis weight of from about 15 to 180 gsm and impregnated substantially through the depth with from about 20 to 70% by weight of a cured thermosetting resin and characterized by one surface which is a nonporous, adhesive-free, fully cured, resin-rich face surface, and another surface which is characterized by an adhesive-rich back surface, the adhesive being compatible with the cured resin, the depth of penetration of the adhesive sufficient to permit the sheet material to be flexible and capable of being handled without fracture thereof, the adhesive-rich back surface adapted to be bonded to a substrate, and the resin-rich surface adapted to be used as a face surface covering on a substrate.

4,158,713

COMPOSITION BOARD WITH IMPROVED POLYMERIC SKIN AND METHOD OF PREPARING SAME

Alfredo Degens, 952 Ave. Delfim Moreira, Rio de Janeiro, Brazil

Division of Ser. No. 693,197, Jun. 7, 1976, Pat. No. 4,083,744.
This application Jan. 20, 1978, Ser. No. 871,147
Int. Cl.[2] B32B *7/02*
U.S. Cl. 428—212 **10 Claims**



1. A flexible, nonfrangible, integrally bonded composite sheet material suitable for use as a face surface covering on a substrate, which sheet material comprises: first and second fibrous sheet materials bonded together by a cured thermosetting resin, the first sheet having a basis weight of from about 20 to 200 g/m^2 and prior to bonding to the second sheet having from about 30 to 70% by weight of a curable thermosetting resin, the second sheet having a basis weight of from about 20 to 200 g/m^2 and adapted to serve as a carrier sheet for the first sheet material and bonded to the first sheet by the cured resin from the first sheet, the first sheet and at least a portion of the second carrier sheet impregnated and bonded together with a cured thermosetting resin, the face surface of the first sheet material characterized by a cured, hard thermosetting-resin face surface adapted for use on a composition board, and the back surface of the second sheet material capable of absorbing into the fibrous back surface of the second sheet material an adhesive material for bonding the integrally bonded composite sheet material to a substrate surface, the sheet material having a thickness of from about 0.1 to 0.5 mm, the composite sheet material being flexible and capable of being handled without fracture thereof.

4,158,714

PROCESS FOR IMPARTING A BETTER ADHESION BETWEEN REINFORCING MATERIALS AND PLASTIC MATRIX AND PRODUCT THEREBY PRODUCED

Corrado Brichta, Milan; Natale Tettamanzi, Arenzano-Genova, and Elio Rial, Milan, all of Italy, assignors to Vitrofil S.p.A., Milan, Italy

Filed Dec. 15, 1976, Ser. No. 750,911
Claims priority, application Italy, Dec. 18, 1975, 30446 A/75; Dec. 18, 1975, 30447 A/75
Int. Cl.[2] B32B *9/00*
U.S. Cl. 428—391 **32 Claims**

1. A process for imparting a better adhesion between reinforcing material and plastic matrix, characterized in that said process comprises the steps of

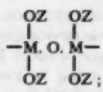
(a) treating the reinforcing material surface at a temperature ranging from 250° to 650° C.; with at least one organic compound of a tetravalent metal having the formula:

$M(OZ)_4$

wherein:

M is Zr or Sn;

(OZ) is an organic radical non-hydrolyzable at room temperature in the presence of water, but hydrolyzable in the presence of water vapor at a temperature between 250° and 650° C.; or a polymeric derivative thereof with a linkage of the type



(b) applying onto the thus treated reinforcing material surface at a lower temperature, at least one silane coupling agent having the formula:

$(OR)_3Si(CH_2)_nX$

wherein:

n is 0, 1, 2 or 3;

(OR) is an organic radical hydrolyzable at room temperature in the presence of water, bound to silicon, and in which R is an alkyl or acyl radical;

X is an organo functional radical promoting the adhesion of the treated reinforcing material to the plastic material; such as chlorine, a vinyl, methacryloxy, amino, glycidoxy, mercaptyl, or an epoxy-cyclohexyl group;

(c) drying the thus treated reinforcing material.

17. A coated reinforcing material for a plastic matrix comprising a reinforcing material coated with an organosiloxymetalloxane polymer to impart enhanced adhesion between said reinforcing material and said plastic matrix, characterized in that said reinforcing material has been subjected to the process comprising the steps of

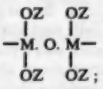
(a) treating the reinforcing material surface at a temperature ranging from 250° C. to 650° C.; with at least one organic compound of a tetravalent metal having the formula:

$M(OZ)_4$

wherein:

M is Zr or Sn;

(OZ) is an organic radical non-hydrolyzable at room temperature in the presence of water, but hydrolyzable in the presence of water vapor at a temperature between 250° and 650°; or a polymeric derivative thereof with a linkage of the type



(b) applying onto the thus treated reinforcing material surface at a lower temperature, at least one silane coupling agent having the formula:

$(OR)_3Si(CH_2)_nX$

wherein:

n is 0, 1, 2 or 3

(OR) is an organic radical hydrolyzable at room temperature in the presence of water, bound to silicon, and in which R is an alkyl or acyl radical;

X is an organo functional radical promoting the adhesion of the treated reinforcing material to the plastic material; such as chlorine, a vinyl, methacryloxy, amino, glycidoxy, mercaptyl, or an epoxy-cyclohexyl group;

(c) drying the thus treated reinforcing material.

4,158,715

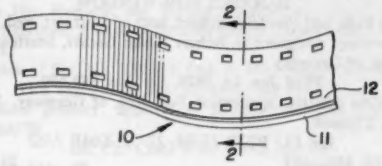
LASER RECORDING FILM WITH OPAQUE COATING

Michael R. Smith, Thousand Oaks; David B. Congleton, San Pedro, and Arthur S. Diamond, Palos Verdes, all of Calif., assignors to The Singer Company, New York, N.Y.

Continuation-in-part of Ser. No. 738,920, Nov. 4, 1976, abandoned. This application Jan. 17, 1978, Ser. No. 870,155

Int. Cl.² B32B *27/36*

U.S. Cl. 428—412 6 Claims



1. A laser recording film comprising:

a flexible film substrate transparent to noncoherent projection radiation;

a coating of self oxidizing nitrocellulose on said film substrate;

said nitrocellulose having homogeneously dissolved dye therein to cause said nitrocellulose to have a neutral black spectral transmissivity to laser radiation.

4,158,716

ELECTRICALLY NONCONDUCTIVE COPPER-BORON COATINGS ON NONMETALLIC SUBSTRATES

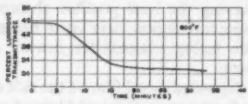
Richard G. Miller, Pittsburgh, and Roy L. Cavitt, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 589,108, Jun. 23, 1975, Pat. No. 4,082,898. This application Dec. 12, 1977, Ser. No. 859,345

The portion of the term of this patent subsequent to Apr. 4, 1995, has been disclaimed.

Int. Cl.² B32B *9/00, 17/06*

U.S. Cl. 428—427 10 Claims



1. An article of manufacture comprising a nonmetallic substrate and an electrically nonconductive copper-boron coating.

4,158,717

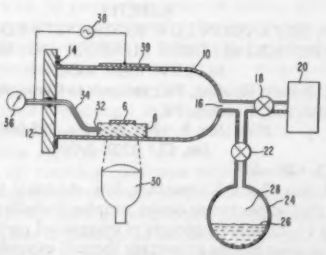
SILICON NITRIDE FILM AND METHOD OF DEPOSITION

Norvell J. Nelson, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 14, 1977, Ser. No. 768,659

Int. Cl.² B05D *3/06*

U.S. Cl. 428—446 2 Claims



1. A method for depositing a film comprising silicon nitride,

said method comprising the steps of:

exposing a substrate to a vapor of azidotrimethylsilane, and creating a plasma discharge in said vapor to deposit said film comprising silicon nitride on said substrate.

2. On a substrate a film comprising silicon nitride deposited by the method of claim 1.

4,158,718

FREELY SUSPENDABLE LIGHT-TRANSPARENT HEAT BARRIER FOR WINDOW

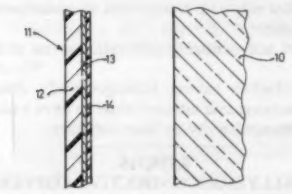
Albin Kehl, and Friedrich Scharf, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,450

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703688

Int. Cl.[2] B32B *15/08, 27/32;* **E04B** *1/62*

U.S. Cl. 428—461 **21 Claims**



1. A substantially light-transparent heat-loss barrier for a light-transmitting and convection-opposing panel, such as a window, forming part of the enclosure of a heated space, said heat-loss barrier comprising a flexible and retractable curtain of laminated composite sheet material suspended loosely and freely on the heated-space side of said panel and spaced therefrom, and capable of being rolled up, said curtain consisting essentially of:

a thin, transparent flexible layer (**12**; **22**) of synthetic resin material having the least possible absorption (A) in the infra-red spectral region, said layer being on the side of said curtain facing towards the inward portion of said heated space;

a thin vapor deposited metal film on the side of said synthetic resin layer facing away from said heated space, said metal film having a high reflectivity (R) in the infra-red spectral region and a high transmissivity (T_F) in the visible light spectral region, and

a transparent flexible cover layer (**14**;**24**, **25**) on the side of said metal film away from said synthetic resin layer for protection of said metal layer from soiling, corrosion and scratching and other mechanical damage and for lending some mechanical stability to said curtain;

said flexible layers being so thin, for the material used, that the composite sheet material formed therewith is capable of being rolled up from suspension for retraction of said curtain.

4,158,719

LOW EXPANSION LOW RESISTIVITY COMPOSITE POWDER METALLURGY MEMBER AND METHOD OF MAKING THE SAME

Earl L. Frantz, Reading, Pa., assignor to Carpenter Technology Corporation, Reading, Pa.

Filed Jun. 9, 1977, Ser. No. 805,040

Int. Cl.[2] B22F *3/00*

U.S. Cl. 428—567 **25 Claims**

1. A low thermal expansion, low electrical resistivity sintered, shaped electronic device member including a lead, comprising 15–85 volume percent of compacted particles of a first metal powder having an average thermal expansion coefficient over the range of 25° C. to 400° C. of less than about 12×10^{-6}/°C., and the balance compacted particles of a second metal powder having an electrical resistivity of less than 200 ohm/cmf, said compacted particles of both powders being substantially intermixed throughout said member, with said second metal powder having a corresponding 400° C. thermal expansion coefficient greater than that of said first metal powder, said first metal powder having an electrical resistivity greater than that of said second metal powder, and the extent of alloying between the particles of said first and second metal powders being so small that said member has a 400° C. thermal expansion coefficient less than that of said second metal powder and an electrical resistivity less than that of said first metal powder.

13. In a method for making a low thermal expansion, low electrical resistivity sintered, shaped electronic device member including a lead, the steps of making a mixture of about 15–85 volume percent of a first metal powder having an average thermal expansion coefficient over the range of 25° C. to 400° C. of less than about 12×10^{-6}/°C. with the balance a second metal powder having an electrical resistivity of less than 200 ohm/cmf, said second metal powder having a corresponding 400° C. thermal expansion coefficient greater than that of said first metal powder, and said first metal powder having an electrical resistivity greater than that of said second metal powder; and sintering and forming said mixture to a sintered and shaped member while controlling the amount of alloying between the particles of said first and second metal powders so that said sintered shaped member has a 400° C. thermal expansion coefficient less than that of said second metal powder and an electrical resistivity less than that of said first metal powder.

4,158,720

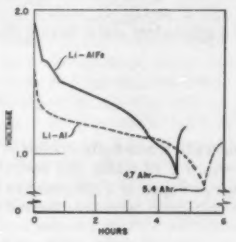
LITHIUM-ALUMINUM-IRON ELECTRODE COMPOSITION

Thomas D. Kaun, Mokena, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1977, Ser. No. 865,164

Int. Cl.[2] H01B *1/02;* **B22F** *1/04*

U.S. Cl. 428—567 **10 Claims**



1. A solid electrode composition for use in the negative electrode of a secondary electrochemical cell, said cell also including an electrolyte containing lithium ions, and a positive electrode including a chalcogen or a transition metal chalcogenide, said solid electrode composition comprising about 5 to 50 atom percent lithium and 95 to 50 atom percent alloy of aluminum and iron, said aluminum and iron alloy comprising about 20 to 35 atom percent iron.

4,158,721

GLASS-TO-METAL SEAL FOR ELECTROCHEMICAL CELLS

John J. Decker, and Donald J. Kantner, both of Emporium, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

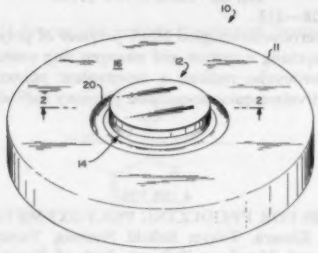
Filed May 11, 1978, Ser. No. 905,090

Int. Cl.[2] H01M *2/08*

U.S. Cl. 429—174 **3 Claims**

1. A glass-to-metal seal for an electrochemical cell terminal comprising: an apertured metal plate, said aperture having a given diameter; a relief ring formed in said plate surrounding said aperture and spaced therefrom so that the area of said metal plate adjacent said aperture is substantially planar; a

metal terminal pin having a first diametered, longitudinally extending portion substantially centrally located within said aperture, said first diametered portion being smaller than said given diameter, and a second diametered portion formed at one end thereof, said second diametered portion being larger than



said given diameter and being longitudinally spaced therefrom; and a sealing material selected from the group of sealing glasses, ceramics and mixtures thereof sealingly filling the area between said relief ring, said aperture and said second diametered portion of said terminal pin.

4,158,722

HIGH ENERGY ELECTROCHEMICAL CURRENT SOURCE

Helmut Lauck, Glashütten, and Franz-Josef Kruger, Vockenhausen, both of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed May 31, 1978, Ser. No. 911,284

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726380

Int. Cl.² H01M *4/58*

U.S. Cl. 429—194 **13 Claims**

1. A galvanic element having a negative metal electrode selected from the group of lithium, calcium, sodium, magnesium, aluminum, zinc, or alloys thereof, a non-aqueous electrolyte, and a positive metal oxide electrode wherein

the electrochemically reducible component of the positive electrode mass is chromium oxide of the formula CrO_x in which x is in the range between 2 and 2.9.

4,158,723

HIGH SPECIFIC ENERGY BATTERY

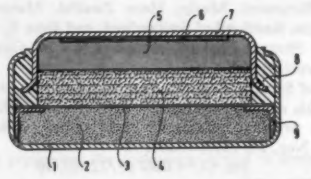
Jean-Paul Gabano, and Michel Broussely, both of Poitiers, France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Sep. 14, 1978, Ser. No. 942,291

Claims priority, application France, Oct. 14, 1977, 77 30946

Int. Cl.² H01M *6/16*

U.S. Cl. 429—197 **7 Claims**



1. An electric cell having lithium as a negative active material, an electrolyte solution of which the solvent is a aprotic liquid, and a positive active material derived from divalent lead oxide, PbO, wherein the improvement comprises:

said derivative being a compound of PbO and an oxide selected from the group consisting of the oxides of bismuth, Bi_2O_3, antimony, Sb_2O_3, and tin SnO_2.

4,158,724

TRIS-TETRAZOLES AS CHEMICAL BLOWING AGENTS

Hugo Illy, Reinach, and Werner Fussenegger, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

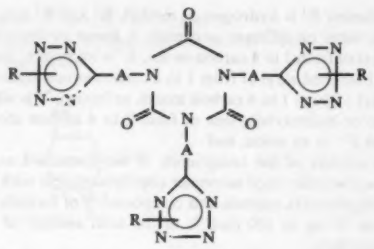
Division of Ser. No. 839,679, Oct. 5, 1977, Pat. No. 4,127,718. This application Sep. 11, 1978, Ser. No. 941,440

Claims priority, application Switzerland, Oct. 18, 1976, 013163/76

Int. Cl.² C08J *9/10*; C07D *251/04*

U.S. Cl. 521—90 **6 Claims**

1. Process for foaming a thermoplastic resin, which process comprises adding to the resin 0.05 to 5% by weight of a tris-tetrazole of the formula I



wherein A represents an alkylene radical of the formula $—CH_2—$, $—CH_2—CH_2—$ or $—CH(CH_3)—CH_2—$, and R represents hydrogen, alkyl of 1 to 4 carbon atoms or phenyl; and heating the mixture.

4,158,725

METHOD OF MANUFACTURING AN ADHESIVE

Makoto Nishimura; Keiichi Naito; Yoshio Fujiwara, and Naotake Kobayashi, all of Utsunomiya, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 25, 1978, Ser. No. 872,108

Claims priority, application Japan, Jan. 31, 1977, 52-9462

Int. Cl.² C08F *8/32*

U.S. Cl. 526—52.1 **10 Claims**

1. A method for the manufacture of an adhesive comprising the steps of:

copolymerizing (a) vinyl compounds capable of copolymerizing with (b) vinyl compounds containing epoxy groups that produce a copolymer having an average molecular weight of from 50,000 to 500,000, said vinyl compounds, (a), containing for every 100 parts by weight, at least 80 parts by weight of an acrylic or methacrylic acid ester of an alcohol containing 1 to 8 carbon atoms, the amount of epoxy compounds, (b), being from 1 to 10% by weight of the entire copolymer,

treating the resulting copolymer with aqueous ammonia in the presence of an amine catalyst in an amount of from 0.005 to 0.5 parts by weight per 100 parts by weight of copolymer to produce an aminated copolymer having an amine value of from 1 to 30, said amine catalyst being present in sufficient amounts to substantially prevent gelatinization during the amination reaction.

4,158,726

PROCESS FOR PREPARING BEAD POLYMERS

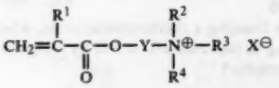
Osamu Kamada; Kenzoh Watanabe, both of Sagamihara, and Shigeru Sawayama, Machida, all of Japan, assignors to Mitsubishi Chemical Industries Ltd. and Kyoritsu Yuki Co., Ltd., both of Tokyo, Japan

Filed Dec. 27, 1977, Ser. No. 864,871
Claims priority, application Japan, Jan. 5, 1977, 52/289
Int. Cl.[2] C08F *2/08, 2/20, 120/00, 222/00*
U.S. Cl. 526—200 18 Claims

1. A process for preparing a water-soluble bead polymer comprising:

(a) forming an aqueous monomer solution containing 60% to 90% by weight of a monomer selected from the group consisting of:

(1) a compound of the general formula I



(I)

wherein R^1 is hydrogen or methyl, R^2 and R^3 may be the same or different and each is linear or branched alkyl of from 1 to 4 carbon atoms, R^4 is hydrogen, linear or branched alkyl of from 1 to 8 carbon atoms, hydroxy alkyl of from 1 to 4 carbon atoms, or benzyl, Y is alkylene or hydroxylalkylene of from 2 to 4 carbon atoms, and X^- is an anion, and

(2) a mixture of the compounds of the formula I and a water-soluble vinyl monomer copolymerizable with the compound (I), wherein this compound of of formula I is from 50 up to 100 mol % of the total amount of the monomers;

(b) dispersing said aqueous monomer solution as droplets in a dispersion medium which is non-compatible with the aqueous monomer solution and which is inert under polymerization conditions, said dispersion medium containing, as a dispersion stabilizer, 0.05 to 10% by weight of a cellulose ester or a cellulose ether which is insoluble in water but soluble in the dispersion medium; and

(c) polymerizing the monomer in the droplets at a temperature of from 40° C. to the temperature at which the dispersion medium boils, in the presence of a free radical polymerization initiator and in the absence of oxygen.

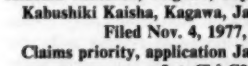
4,158,727

METAL-CONTAINING CURABLE EPOXY RESIN COMPOSITIONS

Hideaki Matsuda, Kagawa, Japan, assignor to Okura Kogyo Kabushiki Kaisha, Kagawa, Japan

Filed Nov. 4, 1977, Ser. No. 848,385
Claims priority, application Japan, Nov. 11, 1976, 51-134644
Int. Cl.[2] C08G *59/42*
U.S. Cl. 528—92 5 Claims

1. A metal-containing curable resin composition, which comprises an epoxy resin incorporated with (i) a dibasic acid anhydride, and (ii) a metal-containing compound having metal-ionic bond in its molecule and having the formula:



wherein, R_1 is the residue of a glycol, R is the residue of a dibasic acid anhydride remaining upon removal of the acid anhydride group, and M is divalent magnesium or calcium.

4,158,728

HETEROCYCLIC-COUPLED POLYMERS OF POLYPHENYLENE OXIDES

Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 20, 1977, Ser. No. 808,021
Int. Cl.[2] C08G *65/44, 65/48*
U.S. Cl. 528—213 18 Claims

1. A heterocyclic-coupled block polymer of polyphenylene oxide comprising a carbon and nitrogen ring containing aromatic heterocyclic radical, a monovalent phenoxy radical and/or a divalent quinone-coupled phenoxy radical.

4,158,729

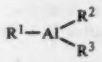
PROCESS FOR PRODUCING POLYOXYMETHYLENE

Harutaka Kimura, Tokyo; Seiichi Nozawa, Yamato; Seiichi Mukai, and Masaharu Shikama, both of Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

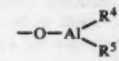
Filed Mar. 30, 1978, Ser. No. 891,838
Claims priority, application Japan, Apr. 14, 1977, 52-42836; Apr. 22, 1977, 52-46508; Oct. 17, 1977, 52-124187
Int. Cl.[2] C08G *2/08*
U.S. Cl. 528—238 12 Claims

1. A process for producing polyoxymethylene which comprises polymerizing formaldehyde in the presence of a catalyst comprising

(a) an organoaluminum catalytic component having the formula (I)



wherein R^1 represents an alkyl or alkoxyl group; R^2 represents an alkyl or alkoxyl group or a halogen atom; R^3 represents an alkyl or alkoxyl group or a halogen atom or



and R^4 and R^5 each represent an alkyl or alkoxyl group or a halogen atom; and

(b) a carboxylic acid amide having at least 12 carbon atoms, as a modifier for supporting said catalytic component.

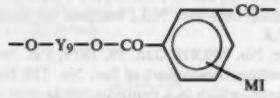
4,158,730

CROSSLINKAGE POLYMERIC COMPOUNDS

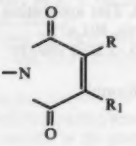
Niklaus Baumann, Marly; Hans Zweifel, Muttenz; Marcus Baumann, Basel, all of Switzerland, and John S. Waterhouse, Cherry Hinton, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 695,347, Jun. 14, 1976, Pat. No. 4,079,041.
This application Dec. 27, 1977, Ser. No. 865,102
Claims priority, application Switzerland, Jun. 18, 1975, 7957/75; Nov. 27, 1975, 15391/75
Int. Cl.[2] C08G *63/12, 63/46*
U.S. Cl. 528—273 11 Claims

1. A polyester, which can be crosslinked under the action of electromagnetic waves, having an average molecular weight between 1000 and 50,000 as measured by viscometry of a 0.5% by weight solution in a 1:1 weight mixture of phenol and symmetrical tetrachloroethane, which is characterized by a structural formula comprising chain members of the formula



in which MI denotes the maleimido group of formula I



(I)

wherein

R and R_1 independently of one another denote alkyl of 1 to 4 carbon atoms, or R and R_1 conjointly denote the remaining part of a five-membered to six-membered carbocyclic ring,

Y_9 represents an aliphatic radical of 2 to 18 carbon atoms, or denotes a cycloaliphatic, araliphatic, carbocyclic-aromatic, heterocyclic-aromatic or heterocyclic-aliphatic radical containing, in each case, a total of at most up to 18 carbon atoms.

4,158,731

CROSSLINKABLE POLYMERIC COMPOUNDS

Niklaus Baumann, Marly; Hans Zweifel, Muttenz; Marcus Baumann, Basel, all of Switzerland, and John S. Waterhouse, Cherry Hinton, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

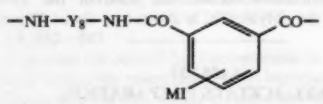
Division of Ser. No. 695,347, Jun. 14, 1976, Pat. No. 4,079,041. This application Dec. 27, 1977, Ser. No. 865,101

Claims priority, application Switzerland, Jun. 18, 1975, 7957/75; Nov. 27, 1975, 15391/75

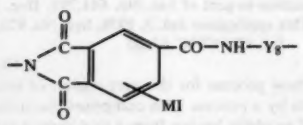
Int. Cl.[2] C08G *69/00, 69/46*

U.S. Cl. 528—322 **10 Claims**

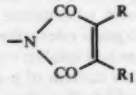
1. A polyamide or polyamide-imide, which can be crosslinked under the action of electromagnetic waves, having an average molecular weight between 1000 and 50,000 as measured by viscometry of a 0.5% by weight solution in N,N-dimethylacetamide or concentrated sulfuric acid, which is characterized by a structural formula comprising chain members selected from the group consisting of



and



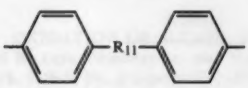
in which MI represents the maleimido group of formula I



(I)

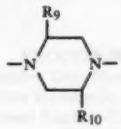
wherein R and R_1 independently of one another denote alkyl of 1 to 4 carbon atoms, or R and R_1 conjointly denote the remaining part of a five-membered to six-membered carbocyclic ring,

Y_8 represents an aliphatic radical of 2 to 18 carbon atoms, or denotes a cycloaliphatic, araliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical containing, in each case, a total of at most up to 18 carbon atoms, or represents a radical of the formula



in which R_{11} denotes $-CH_2-$,

$-SO_2-$, $-S-$ or $-O-$, and, in the case of the polyamides, the radical $-NH-Y_8-NH-$ can also represent



in which R_9 and R_{10} independently of one another can be H, methyl or phenyl.

4,158,732

PROCESS FOR PRODUCTION OF 2-SUBSTITUTED-IMINO-3-ALKYL-TETRAHYDRO-6H-1,3,4-THIADIAZIN-5-ONES

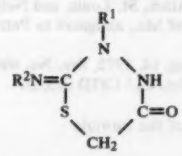
James D. Cleveland, Albany, and Laroy H. Edwards, Napa, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 24, 1978, Ser. No. 889,758

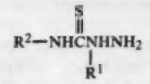
Int. Cl.[2] C07D *285/16*

U.S. Cl. 544—8 **5 Claims**

1. A process for preparing a compound of the formula



wherein R^1 is alkyl of 1 to 6 carbon atoms, R^2 is alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl or phenyl substituted with 1 to 2 substituents selected from the group consisting of alkyl of 1 to 6 carbon atoms, fluoro, chloro, bromo, iodo, nitro, trifluoromethyl, trichloromethyl, tribromomethyl and alkoxy of 1 to 4 carbon atoms, which comprises reacting a thiosemicarbazide of the formula



wherein R^1 and R^2 are as defined above, with an alkyl alphahalothioacetate wherein the alkyl has 1 to 6 carbon atoms and the halo is chloro or bromo in the liquid phase.

4,158,733

7β-ACYLOXY-3-ACETOXYMETHYL CEPHALOSPORINS

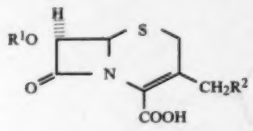
John G. Gleason, Delran, N.J., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 588,096, Jun. 18, 1975, Pat. No. 4,020,057. This application Dec. 1, 1976, Ser. No. 746,289

Int. Cl.[2] C07D *501/50, 501/56;* **A61K** *31/545*

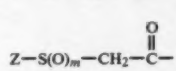
U.S. Cl. 544—29 **2 Claims**

1. A compound of the formula:



in which:

R^1 is an acyl group of the formula:



where:

Z is methyl, trifluoromethyl, trifluoroethyl, cyanomethyl or pyridyl;

m is zero to two; and

R^2 is acetoxy

or a nontoxic pharmaceutically acceptable salt thereof.

2. A compound according to claim 1, said compound being 7β-trifluoromethylmercaptoacetoxycephalosporanic acid.

4,158,734

SUBSTITUTED PYRIDINES

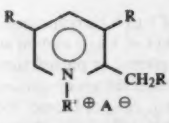
Bernardus A. Oude Alink, St. Louis, and Neil E. S. Thompson, Creve Coeur, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Aug. 14, 1975, Ser. No. 604,609

Int. Cl.[2] C07D *213/20*

U.S. Cl. 546—251 **10 Claims**

1. A composition of the formula



where R and R′ are alkyl, hydroxyalkyl, cycloalkyl or heterocyclic groups and A^- is a carboxylate anion.

4,158,735

SUBSTITUTED HYDROXY PYRIDONES

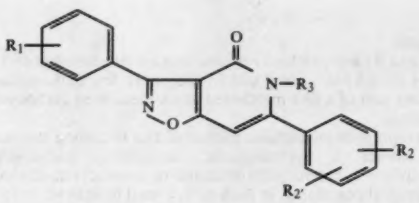
Jeffrey Nadelson, Denville, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 760,818, Jan. 19, 1977, Pat. No. 4,103,013, which is a continuation-in-part of Ser. No. 719,231, Aug. 31, 1976, abandoned, which is a continuation-in-part of Ser. No. 625,817, Oct. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 584,764, Jun. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 558,419, Mar. 14, 1975, abandoned. This application May 1, 1978, Ser. No. 901,477

Int. Cl.[2] C07D *498/14*

U.S. Cl. 546—116 **2 Claims**

1. A compound of the formula



where

R_1, R_2 and R_2' each independently represent hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl, lower alkoxy or trifluoromethyl, and

R_3 represents lower alkyl.

2. The compound of claim 1 which is 5-methyl-3-(p-fluorophenyl)-6-phenyl-isoxazolo[4,5-c]pyridin-4-(5H)-one.

4,158,736

POLYMERS OF ALKYL ACRYLATES

Sheldon N. Lewis, LePlan de Grasse, France, and Richard A. Haggard, Fort Washington, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 241,177, Apr. 5, 1972, abandoned. This application Nov. 5, 1975, Ser. No. 629,186

Int. Cl.[2] C07C *69/54*

U.S. Cl. 560—205 **34 Claims**

1. An alkoxide-polymerized addition polymer of an ester of acrylic acid, said polymer being a homopolymer or a copolymer with one or more other anionically copolymerizable ethylenically-unsaturated monomers, wherein the average chain length of the polymer, $\bar{n}$, is about 6 to about 30 mers.

4,158,737

VINYL ACETATE PREPARATION

Raymond C. Bartsch, Wyoming, Ohio, assignor to National Distillers and Chemical Corp., New York, N.Y.

Division of Ser. No. 750,491, Jan. 14, 1976, Pat. No. 4,119,567, which is a continuation-in-part of Ser. No. 641,799, Dec. 18, 1975, abandoned. This application Jul. 3, 1978, Ser. No. 921,391

Int. Cl.[2] C07C *67/05*

U.S. Cl. 560—245 **8 Claims**

1. In a vapor phase process for the preparation of unsaturated organic esters by a process with comprises contacting a gaseous mixture of an olefin having from 1 to 4 carbon atoms, oxygen, and a lower carboxylic acid having from 2 to 4 carbon atoms with a catalyst comprising a Group VIII noble metal and an alkali metal carboxylate having from 2 to 4 carbon atoms on a catalyst carrier at an elevated temperature and pressure, and recovering the resulting organic esters; the improvement which comprises employing as said catalyst carrier alumina having a crystalline alpha-alumina content of greater than about 96%, a theta-alumina content of less than about 3%, a total calcium and magnesium content of less than about 750

ppm, a surface area of from about 2 to 6 m^2/g, an average crush strength of from about 20 to 45 lbs., a bulk density of less than about 1.35 g/cc, and an acetic acid loading of less than about 1.5% in 200 hours.

4,158,738

PROCESS FOR THE PRODUCTION OF FIBER-GRADE TEREPHTHALIC ACID

Leon S. Scott, Wilmington, Del., and Roy W. Sommers, Pennsville, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 26, 1977, Ser. No. 800,868

Int. Cl.[2] C07C *51/42*

U.S. Cl. 562—416 **10 Claims**

1. In a process for the preparation of fibergrade terephthalic acid comprising oxidizing paraxylene with a molecular oxygen containing gas in a reactor in the presence of a catalyst consisting essentially of cobalt, magneses, sodium and bromine and a solvent comprising a lower monocarboxylic acid wherein (1) the oxidation is conducted in the liquid phase, (2) a portion of the contents of the reactor is continuously vaporized, withdrawn from the reactor and at least a portion thereof condensed and returned to the reactor and (3) the product is continuously withdrawn and subjected to treatment after oxidation and before recovery of the terephthalic acid, the improvement comprising maintaining a high productivity of fibergrade terephthalic acid by maintaining (a) the temperature of the contents of the reactor at at least 210° C., (b) the molecular oxygen content of the vapor withdrawn from the reactor in the rage 3.0–6.0% by volume at least in part by controlling the molecular oxygen introduced into the reactor, (c) the water level of the contents of the reactor in the range 5.0–17% by weight based upon the weight of the liquid portion of the contents of the reactor by controlling the amount of condensed vapor returned to the reactor (d) the mole ratio of cobalt to manganese in the range 0.5–5.0 (e) the burn in the range 8–15 burn units and (f) the productivity of the reaction in the range 0.45–1.45 pounds of terephthalic acid per minute per one hundred pounds of reactor contents.

4,158,739

PROCESS FOR CONVERTING CYCLOPENTANE TO GLUTARIC ACID

Johann G. D. Schulz, and Anatoli Onopchenko, both of Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 20, 1978, Ser. No. 887,943

The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.

Int. Cl.[2] C07C *51/18*

U.S. Cl. 562—543 **9 Claims**

1. A process for converting cyclopentane to glutaric acid in a system consisting essentially of cyclopentane, an aliphatic monobasic acid solvent, cobaltic ions and molecular oxygen, which comprises subjecting cyclopentane to oxidation with oxygen in the presence of cobaltic ions in an aliphatic monobasic acid having only primary and secondary hydrogen atoms and having two to eight carbon atoms, wherein at least about 20 millimols of cobalt are present per mol of cyclopentane, while maintaining a temperature of about 70° to about 150° C. and an oxygen partial pressure of at least about 175 pounds per square inch absolute for a period of about 0.5 to about 3 hours.

4,158,740

OXIDATION OF BUTANE TO ACETIC ACID

Henri K. Lese, Monroeville, and Francis E. Wynne, Allison Park, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 20, 1978, Ser. No. 890,608

Int. Cl.[2] C07C *51/20*

U.S. Cl. 562—549 **15 Claims**

1. A process for converting butane to acetic acid which comprises continuously passing a reaction mixture containing butane, molecular oxygen, acetic acid and cobaltic ions through a reaction zone under elevated temperatures in the range of about 75° to about 130° C. and elevated pressures in the range of about 200 to about 500 pounds per square inch absolute while maintaining therein a partial pressure of molecular oxygen of about 0.6 to about 15 pounds per square inch.

4,158,741

PROCESS FOR PREPARING SORBIC ACID

Mitsuhiro Goi; Masahiko Miyashita, both of Hirakata, and Tokio Hashimoto, Ibaraki, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 29, 1976, Ser. No. 737,014

Claims priority, application Japan, Oct. 30, 1975, 50/131282; Dec. 25, 1975, 50/155948; Dec. 25, 1975, 50/155949; Dec. 27, 1975, 50/157319

Int. Cl.[2] C07C *51/00, 57/10*

U.S. Cl. 562—599 **13 Claims**

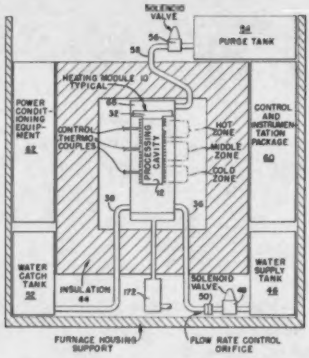
1. A process for preparing sorbic acid which comprises contacting γ-vinyl-γ-butyrolactone with at least one catalyst selected from the group consisting of (A) a solid acid selected from the group consisting of clay minerals, salts and double salts of phosphoric acid with metals, sulfates, boric acid, tungstic acid, phosphotungstic acid, silicotungstic acid, molybdic acid, phosphomolybdic acid, silicomolybdic acid, acetates of metals of Groups I-B, II-B, III-B, IV-B, V-B, VI-B and VIII of the Periodic Table, and propionates of metals of Groups I-B, II-B, III-B, IV-B, V-B and VI-B of the Periodic Table, (B) transition metal oxides, (C) metals of Group VIII of the Periodic Table and (D) halides of metals of Groups I-B, II-B, III-B, IV-B, V-B, VI-B and VIII of the Periodic Table, and recovering the resulting sorbic acid.

4,158,742

GENERAL PURPOSE ROCKET FURNACE

Billy R. Aldrich, Huntsville, and William D. Whitt, Toney, both of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 30, 1976, Ser. No. 746,578
Int. Cl.[2] H05B *3/00*
U.S. Cl. 13—20 22 Claims



1. A multi-purpose rocket furnace for conducting material processing experiments in outer space environments comprising:

a heating module containing a processing cavity;

a plurality of heating elements contained in said heating module capable of heating separate sections of said processing cavity to different temperatures;

a plurality of thermocouples contained in said heating module for measuring the temperature of each of said separate sections;

comparison means connected to said thermocouples for comparing the actual temperature of said sections to a predetermined set temperature; and

adjusting means connected to said comparison means and to each of said heating elements for adjusting the power received by each of said heating elements to ensure that said predetermined set temperature is maintained in each section of said processing cavity; and

gas purge means associated with said module for isothermally cooling said cavity.

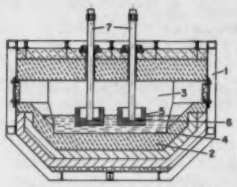
4,158,743

ELECTRIC RESISTANCE FURNACE

Felicjan Biolik, Myslowice; Franciszek Gurgul, Katowice; Stanislaw Odrobina, Katowice; Zygmunt Morys, Katowice; Alfons Wieczorek, Myslowice; Zenon Wydmanski, Sosnowiec, and Piotr Gawlowski, Katowice, all of Poland, assignors to Biuro Projektow Pyrzemyslu Metali Niezelaznych "Bipromet", Katowice, Poland

Filed Feb. 15, 1977, Ser. No. 768,884
Claims priority, application Poland, Mar. 1, 1976, 187637; Apr. 4, 1976, 188490
Int. Cl.[2] H05B *3/03*
U.S. Cl. 13—25 5 Claims

1. An electric resistance furnace for melting metals and maintaining said metals in the melted condition and for producing alloys, particularly nonferrous metals, by direct heating of the furnace bath by resistance heating elements; wherein said furnace includes: a chamber in said furnace; at least one furnace heating element having the shape of a vessel in said chamber; said vessel having wall portions and a bottom, and current suply means having an electrode preferably of graphite, said electrode being dipped in a contact metal in said at least one heating element to complete an electric circuit to said heating element, the melted metal being in contact with the walls and



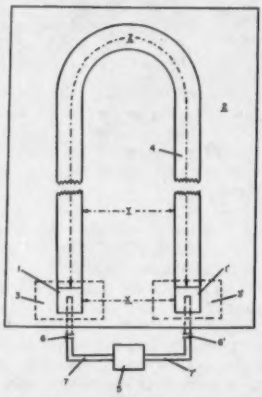
bottom of said heating element and heat being transmitted directly to said metallic bath free of heat exchanging means.

4,158,744

ELECTRICAL RESISTANCE FURNACE FOR THE PRODUCTION OF SILICON CARBIDE

Fritz Petersen, Neuesting, and Andreas Korsten, Balkhausen, both of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 13, 1977, Ser. No. 805,655
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1976, 2630198
Int. Cl.[2] H05B *3/00*
U.S. Cl. 13—25 13 Claims



1. In a furnace installation, for the production of silicon carbide from silicon dioxide and carbon in intermittent operation, actuated by direct electric heating according to the resistance principle, wherein the current is supplied by means of electrodes through a resistance core of carbon-containing material, said core being horizontally embedded in the burden consisting of a mixture of granulated coke, quartz sand and additive materials, the improvement which comprises: said resistance core being in a semicircular to U-shape and said electrodes being spaced so that the ratio of the length of the resistance core to the distance between said electrodes is at least 1.6

4,158,745

LEAD FRAME HAVING INTEGRAL TERMINAL TABS

Joseph R. Keller, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 27, 1977, Ser. No. 846,052
Int. Cl.[2] H01L *24/48*
U.S. Cl. 174—52 FP 13 Claims

1. A continuous strip of stamped and formed lead frames, each lead frame of said strip being intended to receive, and

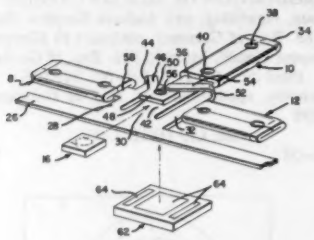
establish electrical connections to, a chip having oppositely directed faces and having two contact areas on one of said faces and having one contact area on the other face, said strip comprising:

a continuous carrier strip means, said lead frames being integral with said carrier strip means at spaced-apart intervals,

each of said lead frames having a chip receiving zone which is spaced from said carrier strip means, each of said lead frames comprising first, second, and third arms, said arms being integral with said carrier strip means,

each of said arms having an integral terminal portion, each of said terminal portions being generally rectangular and comprising a plurality of thicknesses of sheet metal and being dimensioned to be mated with a complementary terminal device, said terminal portions radiating from said chip receiving zone of each lead frame,

said second arm of each lead frame having integral chip supporting surface portions in said chip receiving zone,



said first and third arms having contact members which extend at least partially across said chip supporting surface portions, said contact members of said first and third arms having contact tip portions for establishing electrical contact with said two contact areas on said one face of a chip whereby,

upon placement of a chip on said chip supporting surface of one of said lead frames with said other face of said chip against said chip supporting surface and with said contact members extending across said one face of said chip, said chip supporting surface will be in electrical contact with said one contact area on said other face of said chip, and said contact tip portions of said contact members will be in electrical contact with said two contact areas on said one face of said chip, and upon severing said one lead frame from said strip and bending said terminal portions away from the plane of said strip in a common direction, said terminal portions will surround said chip receiving zone and external conductors can be connected to said chip by mating terminals in said external conductors with said terminal portions of said arms.

4,158,746

CABLE WITH COLOR CODING IDENTIFICATION OF GROUPS

David W. Taylor, Chateauguay, and Jean P. Waucheul, LaSalle, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 1, 1978, Ser. No. 901,462
Int. Cl.[2] H01B 7/36
U.S. Cl. 174—112 **12 Claims**

1. A telecommunications cable comprising a plurality of twisted pairs of conductors arranged in a number of groups and the groups arranged in at least two units with at least two groups in a unit, the conductor pairs in a group having a colour coding unique to that group, each group having at least twenty five twisted pairs of conductors;

said colour coding comprising a preselected common colour identification common to one conductor of each pair in a group and the other conductor of each pair having a colour identification which is one of a predetermined number of different colour identifications clearly distinguishable from said common colour identification and defining, in conjunction with said common colour identification of said one conductor, the twist type for each pair in said group, the number of twist types in a group less than the numbers of pairs of conductors in the group, a group identified only by said common colour identification, and a different common colour identification for each group in a unit; and

a binder around each unit;

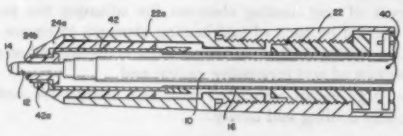
any one pair of conductors in a unit having a particular twist type being separated from any other pair of conductors having the same twist type by a minimum distance of the order of two pairs of conductors.

4,158,747

ELECTROSTATIC TABLET WRITING STYLUS

Alex M. Muller, and Joseph L. Tyrrell, both of Rancho Palos Verdes, Calif., assignors to Telautograph Corporation, Los Angeles, Calif.

Filed Jun. 26, 1978, Ser. No. 919,264
Int. Cl.[2] G08C 21/00; H04N 1/00
U.S. Cl. 178—19 **7 Claims**



1. A device for sensing a dynamic electrostatic field through a tablet of paper on a writing table comprising

a stylus of conductive material having an extended body portion and tip for writing on said tablet,

a tubular member of conductive material surrounding said stylus over at least a portion thereof near said tip and insulated therefrom,

amplifying means directly connected to said tubular member, and

means for connecting said stylus to ground reference potential for said amplifying means.

4,158,748

APPARATUS FOR DIGITAL DATA SYNCHRONIZATION

John En, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 27, 1977, Ser. No. 810,249
Int. Cl.[2] H04L 7/00
U.S. Cl. 178—69.1 **2 Claims**

1. A digital communication system for processing a data bit stream having a length M, said bit stream including a predeter-

mined initial identification bit sequence, the system comprising:

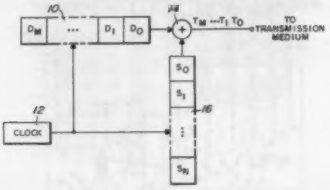
encoder means for encoding said data bit stream including:

encoder bit storage means having N predetermined sync bits stored therein;

combining means for predeterminedly combining said N sync bits with said M data bits to thereby produce a transmission bit stream having a bit length less than M+N;

decoder means for decoding said transmission bit stream including;

decoder sync bit storage means having said N predetermined sync bits stored therein;



processing means for predeterminedly processing said transmission bit stream with said N sync bits to thereby regenerate said data bit stream;

identification bit storage means having said initial identification bit sequence stored therein; and

detector means for comparing the regenerated data bit stream with the contents of said identification bit storage and producing a detect indication output responsive to a predetermined minimum correlation therebetween to allow passage of the remainder of the regenerated bit stream to an output terminal.

4,158,749

ARRANGEMENT FOR DISCRIMINATING SPEECH SIGNALS FROM NOISE

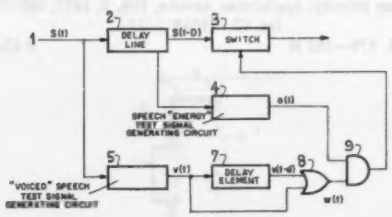
Pierre Deman, and Jean Potage, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 6, 1978, Ser. No. 875,679

Claims priority, application France, Feb. 9, 1977, 77 03606

Int. Cl.[2] G10L *1/00*

U.S. Cl. 179—1 SC **4 Claims**



1. An arrangement for discriminating speech signals from noise in an input signal, said arrangement comprising: a delay line for imparting to said input signal a delay of duration D, said delay line having at least one output; first means for generating a first test signal, indicative, with a limited degree of probability, of the presence of speech signals, voiced or unvoiced, in the signal appearing at said output of said delay line; second means, having an input for receiving said input signal, for generating a second test signal indicative, with a higher degree of probability, with a delay due to the response time of said second means, of the presence of voiced sound speech signals, in said input signal; third means for prolonging said second test signal by a duration d; and further means for delivering a speech decision signal, relative to the signal appearing at said output of said delay line, in the presence of both said first test signal and the prolonged second test signal; said duration D and d being taken sufficiently high for the duration of the prolonged second test signal to encompass on both sides the time interval during which the signals in response to which the second test signal was generated appear at said output of said delay line, the time elapsing between the beginning of the prolonged second test signal and the beginning of said time interval having a duration sufficient for the auditive identification of an unvoiced consonant preceding a voiced sound, and the time elapsing between the end of said time interval and the end of said prolonged second test signal having a duration sufficient for the auditive identification of an unvoiced consonant following a voiced sound.

4,158,750

SPEECH RECOGNITION SYSTEM WITH DELAYED OUTPUT

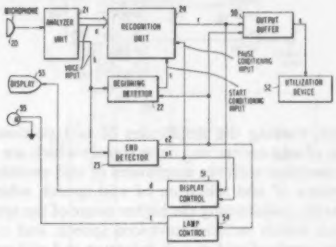
Hiroaki Sakoe, and Seibi Chiba, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 26, 1977, Ser. No. 800,819

Claims priority, application Japan, May 27, 1976, 51-61984; Jun. 1, 1976, 51-64197

Int. Cl.[2] G10L *1/00*

U.S. Cl. 179—1 SD **8 Claims**



1. In a speech recognition system of the type including recognition means responsive to a voice input and a conditioning input for recognizing said voice input to produce a recognition output representative of a result of recognition, said voice input including at least one brief pause interval and an end interval, said end interval defining the end of said voice input, wherein the improvement comprises beginning detection means responsive to said voice input for producing a start pulse representative of the beginning of said voice input, end detection means responsive to said voice input for producing a pause interval detection signal representative of at least one of said pause interval and said end interval and an end detection signal representative of said end interval, means for supplying said start pulse and said pause interval detection signal to said recognition means as said conditioning input, display means responsive to said pause interval detection signal and said recognition output for displaying said results of recognition, and output means responsive to said end detection signal for supplying said recognition output to a utilization device.

4,158,751

ANALOG SPEECH ENCODER AND DECODER

Harald E. W. Bode, 1344 Abington Pl., North Tonawanda, N.Y. 14120

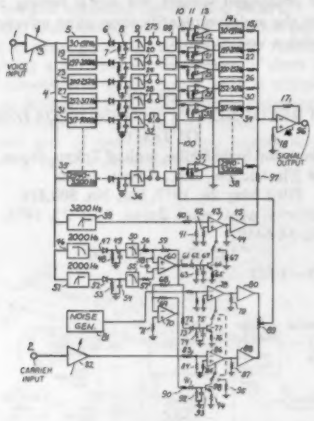
Filed Feb. 6, 1978, Ser. No. 875,686

Int. Cl.[2] G10L *1/00*

U.S. Cl. 179—1 SA **19 Claims**

1. The method of processing speech which comprises the steps of encoding speech into a multiplicity of signals corresponding to the amplitude of said speech in successive portions of the lower and midrange of the frequency spectrum of said speech which includes voiced speech and into control signals representing when said speech is voiced and when said speech

is unvoiced, and decoding said multiplicity of signals said decoding step comprising the steps of admitting carrier and noise signals, then transmitting successive portions of the spectrum of said carrier signals when said control signals representing said voiced speech are present and successive portions of the spectrum of said noise signals when said control signals representing unvoiced speech are present, said successive portions of the spectrum of said noise and carrier signals and said successive portions of said speech signals corresponding to



each other, varying the amplitudes of said portions of said spectrums of said carrier and noise signals which are transmitted in accordance with the amplitudes of said encoded signals from portions of said spectrum of said speech which correspond thereto, transmitting the higher range of the spectrum of said speech which includes unvoiced speech, and combining said higher range of said speech spectrum and said portions of said carrier and noise signals which are transmitted to reproduce said speech.

4,158,752

CARRIER SUBSCRIBER TELEPHONE STATION TERMINAL LOOP CURRENT BOOSTER

James A. Stewart, Menlo Park, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 21, 1977, Ser. No. 862,802
Int. Cl.[2] H04B *3/00*
U.S. Cl. 179—2.5 R **26 Claims**

1. Apparatus, in a carrier subscriber station terminal including a local battery and a handset in a local loop and a transmit oscillator producing a first carrier signal having a first frequency on a cable pair for transmission to a central office when the handset is off-hook, for providing a local loop voltage in the station terminal loop that may be greater than the local battery voltage when the handset is off-hook, comprising:

first means, which is an inductive means for storing electrical energy, being electrically connected in series with the battery in the local loop;

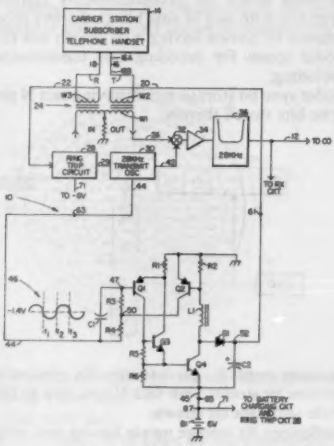
second means, which is a switch means, electrically connected to the series combination of said first means and the battery so as to enable a battery current to pass through said first means for inducing a field on it when said second means is closed;

third means, which is a means for storing electrical energy, being electrically connected across the local loop;

fourth means coupling a signal representative of the first carrier signal to said second means during an off-hook condition of the handset for selectively closing the second means for passing a battery current through said first means for inducing a field on the latter which stores energy;

fifth means which is a control means responsive to current in said first means for selectively opening said second means when this current exceeds a prescribed value; and

sixth means decoupling said first means from said third means when said second means is closed for storing energy in said first means, and coupling said first means to said third means when said second means is open for enabling energy stored in said first means to be transferred to said third means for producing a voltage thereon for driving the local loop.

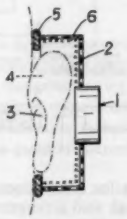


4,158,753

HEADPHONE OF CIRCUMAURAL DESIGN

Rudolf Görike, Vienna, Austria, assignor to AKG Akustische u.Kino-Gerate Gesellschaft m.b.H., Austria

Filed Jan. 30, 1978, Ser. No. 873,391
Claims priority, application Austria, Feb. 2, 1977, 669/77
Int. Cl.[2] H04R *1/22*
U.S. Cl. 179—182 R **8 Claims**



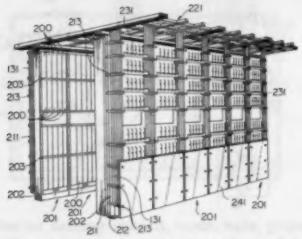
1. A headphone engageable on a person's head around the ear, comprising a cup-shaped case having an encircling rim around its periphery, a flat soft sealing strip engaged around said rim and engageable with the wearer's head around the ear having a maximum thickness of approximately three mm, said case forming a coupling space enclosing the user's ear, at least one electroacoustic transducer having a diaphragm included in cup-shaped case, acoustic frictional resistance means coextensive with all of the surfaces of said cup-shaped case, and compensating means for reduction of responses at low frequencies operatively associated with said headphone.

4,158,754

MOUNTING APPARATUS FOR COMMUNICATION EXCHANGE EQUIPMENT

Jimpachi Yonezaki, Yokohama; Yoshihiro Takahashi, Kawasaki; Toshihiko Shimada, Tama, and Katsuo Okuyama, Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan

Filed Aug. 20, 1976, Ser. No. 716,299
Claims priority, application Japan, Aug. 25, 1975, 50-103162
Int. Cl.[2] H04Q 1/14
U.S. Cl. 179—98 18 Claims



1. A mounting apparatus for a telephone exchange unit for communication signals, said telephone exchange unit including a plurality of components, each of which has a mounting frame for mounting a plurality of electronic control units thereon, said mounting apparatus comprising: means for both supporting said components and for distributing a large number of communication signal cables between one component and other components including: supporting poles which are supported at their bottom ends at predetermined respective positions along and close to a respective position at which the component will be located, and frameworks which are assembled horizontally above said supporting poles and rigidly fixed to the top ends of said supporting poles so as to form one body, wherein both said supporting poles and said frameworks are constructed so as to permit the pre-arranging of said communication signal cables by the time a plurality of said components are positioned close to corresponding supporting poles.

4,158,755

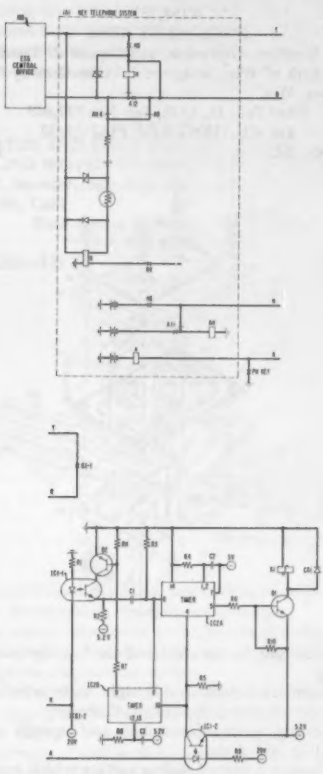
TELEPHONE SYSTEM OPEN SWITCHING INTERVAL PROTECTION CIRCUIT

Phillip P. Daniele, Oceanport, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 14, 1978, Ser. No. 924,695
Int. Cl.[2] H04Q 5/18
U.S. Cl. 179—99 H 5 Claims

1. An arrangement for preventing a key telephone system connected to a central office line from improperly releasing a customer-applied holding condition when the central office exhibits an open switching interval that interrupts line current to release an operated hold apparatus in the key system, comprising:

means for detecting the release of said hold apparatus, and switching means controlled by said detecting means for temporarily reconnecting said hold apparatus in circuit



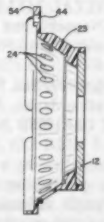
with said central office line after said central office interrupts said line current.

4,158,756

DYNAMIC LOUDSPEAKER WITH PLASTIC BASKET ENCAPSULATING FRONT POLE PLATE

William J. Keezer, Medway, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Aug. 27, 1976, Ser. No. 718,178
Int. Cl.[2] H04R 9/02, 9/06, 1/02
U.S. Cl. 179—115.5 R 30 Claims



1. A loudspeaker assembly comprising,

front and rear pole plates of low reluctance magnetic material,

a plastic basket formed with said front pole plate encapsu-

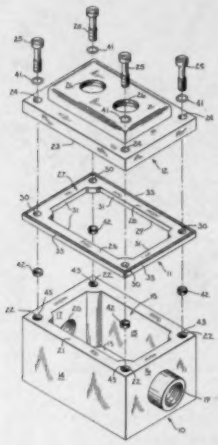
lated by said plastic with said rear pole plate free of encapsulation by said plastic.

4,158,757

ENCLOSURE SEAL

Gilbert A. Reichert, Greendale, and Dennis J. Trendel, Mukwonago, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Feb. 15, 1978, Ser. No. 877,847
Int. Cl.[2] H01H *9/04*; F16J *15/32*
U.S. Cl. 200—302 **10 Claims**



1. An enclosure for an electrical device, the combination comprising:

a base having a bottom and upright walls which define a cavity for receiving the electrical device;

a first sealing surface formed on said upright walls and encircling said cavity;

a cover having a second sealing surface which opposes said first sealing surface when said cover is positioned in place over said cavity;

a seal disposed between said opposing first and second sealing surfaces, said seal including a frame having an inner edge which encircles said cavity and an outer edge which extends around the periphery of the enclosure, said seal also including a ring formed on the outer edge of said frame from an elastomeric material, which ring includes oppositely directed beads that bear against the respective first and second sealing surfaces when the cover is fastened in place over said cavity.

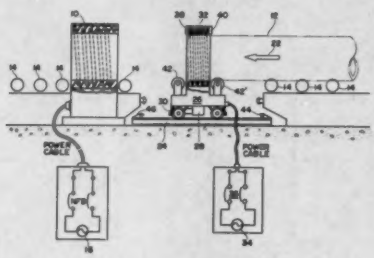
4,158,758

METHOD AND APPARATUS FOR HEAT TREATMENT OF METAL MEMBER

Kazuo Kunioka; Takao Noguchi, and Tomoshige Sudo, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1977, Ser. No. 820,855
Claims priority, application Japan, Aug. 3, 1976, 51/92052
Int. Cl.[2] H05B *5/06*
U.S. Cl. 219—10.43 **3 Claims**

1. A method for induction heating a metal member by induction heating coil means, comprising the steps of: conveying said metal member through induction heating coil means; holding an end portion of said metal member and said induction heating coil means for preventing relative movement therebetween for preliminary heating of said end portion for a predetermined period of time to obtain substantially uniform heating temperature distribution throughout said metal member; detecting incoming of a head end portion of said metal member into a preliminary induction heating coil provided on the inlet side of a main induction heating coil for movement in both directions along a direction of conveyance of said metal member toward said heating coils, to move said preliminary induction heating coil together with said head end portion of the metal member in a manner that there is no relative movement therebetween for preheating said head end portion for a



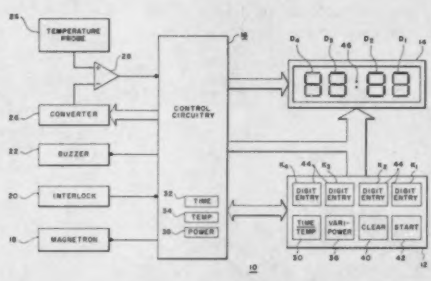
predetermined period of time; moving said preliminary induction heating coil in the opposite direction to return said coil to its initial position; and detecting incoming of a rear end portion of said metal member into said preliminary induction heating coil together with said rear end portion of the metal member in a manner that there is no relative movement therebetween to preheat said rear end portion for a predetermined period of time.

4,158,759

MICROWAVE OVEN CONTROL SYSTEM

William B. Mason, Arlington, Tex., assignor to Teccor Electronics, Inc., Euless, Tex.

Filed Sep. 16, 1977, Ser. No. 833,907
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 B **16 Claims**



1. A microwave oven control system comprising:

a keyboard having a plurality of actuable keys for receiving user commands, the actuable keys including a plurality of digit entry keys for entering numerical operating data into the system,

an electronic display having a plurality of digit positions for displaying the numerical operating data, each digit position being capable of selectively displaying the ten decimal numerals in response to actuation of a corresponding digit entry key, each digit position being slewed through a count sequence of some or all of the ten decimal numerals as long as the corresponding digit entry key is held actuated, whereby numerical operating data is entered into the display by holding one or more of the digits entry keys actuated until the desired numerals are displayed by the digit positions of the display, and

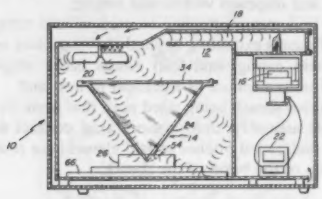
control circuitry responsive to the commands from the keyboard for controlling the operation of the system and outputting data to the display.

4,158,760

SEED HEATING MICROWAVE APPLIANCE

Robert F. Bowen, Burlington; George Freedman; Wesley W. Teich, both of Wayland; Thomas J. Martel, North Reading, and E. Eugene Eves, II, Nabnasset, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 30, 1977, Ser. No. 865,824
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 E 25 Claims



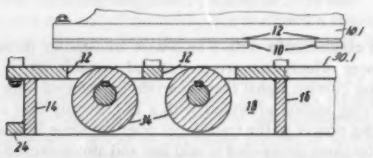
1. Apparatus for heating kernels, seeds, nuts, grains and like items comprising a microwave cavity, means for directing microwave energy into said cavity, an appliance removably positioned in said cavity within the field of radiation from said means and comprising a conical bowl closed at its smaller end and having a lower region of restricted internal volume with means for retaining said items in a massed clump and an upper region of a volume greater than the volume of said lower region, said bowl being transparent to microwaves.

4,158,761

PLURAL WORK-PIECE POSITIONING APPARATUS

Horst Wittenstein, Ennepetal, Fed. Rep. of Germany, assignor to Carl Dan. Peddinghaus KG, Ennepetal, Fed. Rep. of Germany

Filed Jun. 15, 1977, Ser. No. 806,603
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1976, 2627838
Int. Cl.[2] B23P 1/04
U.S. Cl. 219—69 R 1 Claim



1. Apparatus for positioning a plurality of workpieces for spark machining thereof in an immersion bath, the apparatus comprising

a stationary support for one of the workpieces and an adjustable support for another workpiece, the two workpiece supports being disposed in side by side relation,

an electrode holder and a pair of electrodes overlying, respectively, the stationary and adjustable workpiece supports,

the adjustable workpiece support including at least two rotatably mounted rollers with their outer surfaces arranged to act as abutments for a workpiece to be machined, the radial distance between the axis of rotation of each roller and its surface progressively increasing in a circumferential direction over at least a part of the surface to provide a positional adjustment of said workpiece on rotation of the rollers, the rollers having substantially cylindrical surfaces eccentrically related to the axis of rotation thereof, and

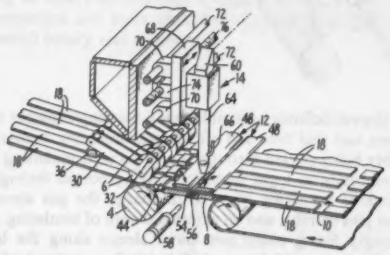
frame means defining a chamber confining the rollers therein and a coverplate overlying said chamber and having openings therein receiving the outer surfaces of the rollers, wall means adjacent one end of each of the adjoining rollers and defining a gear wheel chamber sealed from said first mentioned chamber and free of the immersion bath, gear wheels in said gear wheel chamber and connected with the rollers for turning the rollers and raising and lowering the outer surfaces thereof relative to the coverplate and to the stationary workpiece support, whereby to facilitate simultaneous spark machining of multiple workpieces in accurate relation to each other.

4,158,762

APPARATUS AND METHOD FOR CUTTING AND HEAT SEALING WOVEN THERMOPLASTIC MATERIAL

Richard J. Saunders, San Jose, Calif., assignor to Coherent, Inc., Palo Alto, Calif.

Filed Jan. 4, 1978, Ser. No. 866,942
Int. Cl.[2] B23K 9/00
U.S. Cl. 219—121 L 14 Claims



1. Apparatus for cutting and heat sealing the ends of lengths of woven thermoplastic material, comprising

feeding means selectively activated for feeding predetermined lengths of said material from a supply of said material across a supporting surface;

means for releasably clamping said material lengths against said supporting surface, said clamping means including means defining a gap of predetermined width extending transversely of said material lengths to expose portions of said material through said gap;

a laser having an output beam of sufficient power to remove said material portions exposed to said beam and to melt together the portions of said material immediately adjacent said removed portions;

means for directing said laser beam against said material portions exposed through said gap and for focussing said beam onto said material in a spot having a diameter generally equal to said gap width; and

means for moving said laser beam directing means transversely of said lengths of material along said gap, while maintaining said focus whereby the material exposed to the beam through the gap may be removed and the portions of the material immediately adjacent the gap may be melted together and thus heat sealed.

4,158,763

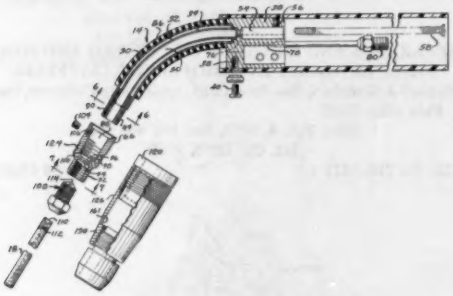
CURVED NOZZLE WELDING GUN

Delford A. Moerke, 127 E. Morningside Ave., Lombard, Ill. 60148

Filed Aug. 4, 1977, Ser. No. 821,743
Int. Cl.[2] B23K 9/28
U.S. Cl. 219—137.42 26 Claims

1. In a gas shielded arc welding gun having a handle of electrically insulative material, a curved nozzle embodying concentric, longitudinally-curved inner and outer sleeves of electrically conductive metal, and fore and aft-located mounting bodies of electrically conductive metal to which the respective ends of the sleeves are silver brazed in gas sealing relation, the aft-located mounting body being releasably securable within the gun handle and having a passageway which

aligns with the bore of the inner sleeve and into which a consumable wire electrode feeds, the fore-located mounting body having a center bore which aligns with the inner sleeve bore to receive the wire electrode fed therethrough, said fore-located mounting body being externally threaded for mounting of an adapter by which a current pickup tube is connected to the curved nozzle in line with said inner sleeve bore, the inner and



outer sleeves defining an annular gas collecting chamber therebetween and said fore and aft located mounting bodies, said chamber being ported through the aft-located mounting body for connection to a gas supply and being ported through the fore-located mounting body to discharge the gas about the current pickup tube, and an external sheath of insulating material snugly fitting about said outer sleeve along the length thereof between said fore and aft-located mounting bodies.

4,158,764

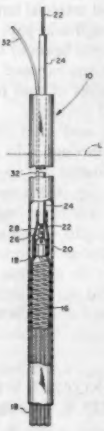
DEVICE FOR HEATING LIQUID IN A CONTAINER

Frank J. Yane, 215 Butternut La., Northfield, Ohio 44067

Continuation-in-part of Ser. No. 589,798, Jun. 24, 1975, abandoned. This application Jan. 3, 1977, Ser. No. 756,249

Int. Cl.[2] H05B *3/06*

U.S. Cl. 219—523 **4 Claims**



1. A flexible heating cable assembly for immersion heating of a liquid in a container, said cable comprising:

(a) a heating element disposed in coiled, axially spaced internally unsupported pitches of substantially uniform diameter having a length substantially greater than the coil diameter, said element being formed of bare wire having a high electrical resistance;

(b) a flexible braided sheath of fibrous glass material received over said coiled pitches along the length thereof, said sheath having the inner periphery thereof disposed in closely fitting arrangement with the outer diameter of said coiled pitches and in direct free sliding contact therewith;

(c) an outer tubular casing formed of resilient electrical insulating material having a low surface coefficient of friction and a high resistance to heat and attacks by acid and alkaline solutions, said casing being received over said sheathed coiled element and in direct free sliding contact with said braided sheath along the length thereof;

(d) connecting means attached to each end of said coiled element and disposed within said casing;

(e) power lead means attached to each of said connectors, said lead means extending beyond the respective adjacent end of said casing, said lead means being adapted for connection to a source of electrical power; and

(f) said braided sheath being sized such that upon flexing of said cable assembly, deformation, axial contact and collapse of said coiled pitches of said element are resisted by tensioning of the braid of the sheath.

4,158,765

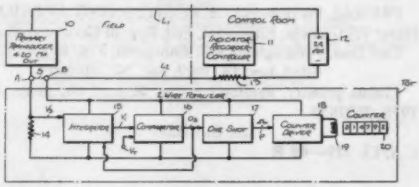
TOTALIZER FOR TWO-WIRE TRANSMITTER

Herbert Shauger, Willow Grove, and Roy Schmoock, Richboro, both of Pa., assignors to Fischer & Porter Co., Warminster, Pa.

Filed Nov. 8, 1977, Ser. No. 849,696

Int. Cl.[2] G01F *1/32;* **H03K** *25/00*

U.S. Cl. 235—92 NT **7 Claims**



1. In combination with a two-wire transmitter including a transducer which converts a metered variable into a corresponding current signal that is carried by the two-wire line to a receiving station provided with a D-C supply that supplies operating power to the transducer over the same line, an electronic totalizer interposed in said line and also powered by said supply, said totalizer comprising:

A. an input circuit having an impedance through which said current signal flows to develop a corresponding voltage signal, said input circuit further including a first Zener diode across which a constant voltage is developed to provide a power source;

B. a resettable integrator energized by said power source and responsive to the voltage signal to produce a time-integrated voltage that rises above a base level at a rate depending on the varying magnitude of the voltage signal;

C. a comparator energized by said power source and coupled to the integrator to produce an output signal only when the integrated voltage reaches a threshold set by a reference voltage, said output signal being fed back to said integrator to effect resetting thereof;

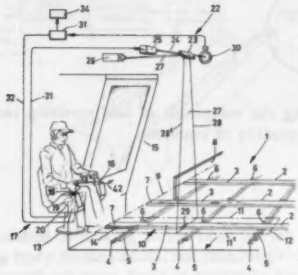
D. means energized by said power source and coupled to said comparator to generate a pulse each time an output signal is yielded thereby; and

E. a counter energized by said power source responsive to the pulse produced by the comparator and provided with a digital display whereby the number of pulses indicated thereby represents the time-integrated total of the metered variable.

4,158,766
INSPECTION OF ELONGATED WORKPIECES SUCH AS RANDOM LENGTH BOARDS

Bo Sjödin, Jonkoping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Mar. 23, 1978, Ser. No. 889,199
Claims priority, application Sweden, Mar. 25, 1977, 7703417
Int. Cl.[2] G06M *3/06, 7/00*
U.S. Cl. 235—92 DN 8 Claims



1. In a process wherein random length elongated workpieces such as boards and other lumber pieces, each of which may be of unacceptable quality along a portion of its length, are trimmed to finished pieces that are wholly of acceptable quality, a method of producing an input which can be fed to a computer and which signifies a location along the length of a workpiece at which a hypothetical cut transverse to its length will effect minimum reduction of its length while removing all portions of unacceptable quality that are adjacent to one of its ends, which input enables the computer to calculate the location of an actual cut that will yield the optimum standardized-length finished piece obtainable from the workpiece, said method being characterized by:

A. establishing each workpiece, in turn, in an inspection zone defined by parallel, spaced apart boundaries,

(1) with the workpiece located between said boundaries and extending lengthwise parallel to them and

(2) with one end of the workpiece in a known relationship to a reference line that extends transversely to said boundaries;

B. producing a light beam which shines substantially downwardly onto said inspection zone and which extends substantially from one to the other of said boundaries but is substantially narrow in directions parallel to said boundaries, to provide a transverse line of illumination across a workpiece at the inspection zone;

C. manually moving said light beam in directions parallel to said boundaries to shift said line of illumination lengthwise along said workpiece;

D. producing an output having a magnitude so corresponding to the position of said line of illumination in relation to said reference line that said output has a unique magnitude for each incrementally different distance between said line of illumination and said reference line; and

E. when the line of illumination is established at a location along a workpiece that is proper for a hypothetical cut, feeding to the computer, as an input, the output magnitude then obtaining and which signifies the distance from said reference line to said line of illumination.

4,158,767
PROGRAMMABLE BINARY COUNTER

James R. Long, Huntsville, Ala., assignor to Avco Corporation, Huntsville, Ala.

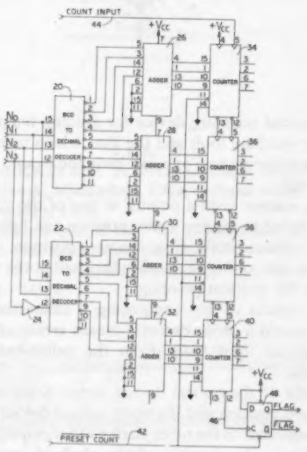
Filed Apr. 24, 1978, Ser. No. 898,904
Int. Cl.[2] H03K *21/36*
U.S. Cl. 235—92 PE 6 Claims

1. A programmable counter for giving an output indication after the count of the incoming signal pulse train has reached a preselected binary real number 2^N where N is any positive integer (o, 1, 2, 3, ..., i), said counter comprising:

means for receiving an instruction designating said binary real number 2^N, said instruction using no more than the number of data bits required to represent the maximum selectable value of N;

a decoder encircuited with and responsive to the instruction receiving means, said decoder having as many parallel output lines as there are programmable values of N in said instructions, said decoder providing on said output lines electrical potentials representative in binary terminology, the one's complement of said programmed binary number 2^N;

adder means having an input connected to the output lines of said decoder, said adder means being encircuited to provide an output consisting of electrical potentials representing in binary terminology a logic sequence which is one numerical unit more than the complement of said preselected binary real number;



a multistage presettable binary counter having a clock line input for accepting counting pulses from an external source, said counter having binary register capacity adequate to store the maximum value of said preselected binary real number 2^N, said counter including an output line carrying an electrical potential which switches from the binary zero logic level to the binary one logic level whenever the registers of said binary counter reach the overflow condition;

circuit means for first, presetting all registers of said counter with the binary word sample present on the output lines of said adder means, and second, subsequent to the new word being loaded into counter, restoring the presettable counter to the state whereby clock pulse counting can begin; and

means coupled to the output line of said presettable binary counter for providing an indication that said counter has reached the overflow condition.

4,158,768

BI-AXIAL SCANNING DEVICE FOR FOLLOWING THE OUTLINE OF A TEMPLATE

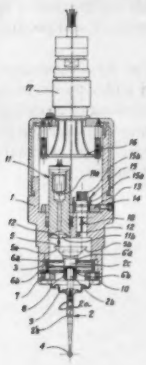
Riccardo Lavelli, Lugano, Switzerland, assignor to S.G.T.C. Societe Generale Internationale de Recherches Techniques et de Consulence S.a., Balzers, Liechtenstein

Filed Sep. 27, 1977, Ser. No. 837,216

Claims priority, application Switzerland, Sep. 27, 1976, 12201/76

Int. Cl.[2] G01D *5/30*

U.S. Cl. 250—202 **7 Claims**



1. A bi-axial scanning device for guiding template copying means for machine tools and the like, which comprises

(a) a shaft having two opposite ends and a point intermediate the ends,

(1) a scanner with a pointer at one of the shaft ends and adapted to assume a zero position and follow the shape of a plane profile from the zero position,

(b) a flat disc spring supporting the shaft at the interimediate point for resilient pivoting,

(c) an optical device comprising a calibrated light beam means and a photo-detector means arranged to receive a calibrated light beam from the calibrated light beam means,

(1) one of the optical device means being arranged in a fixed position and the other optical device means being connected to the other shaft end for displacement therewith upon pivoting of the shaft in response to the pointer in contact with the template, the displacement being detected by the photo-detector means and producing control signals emitted from the photo-detector means,

(d) an amplifier means connected to the photo-detector means to receive the control signals therefrom, and

(e) an outlet for transmitting the amplified control signals.

4,158,769

DETERMINATION OF URANIUM CONTENT IN MATERIAL

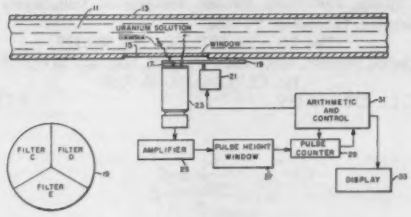
Richard C. Smith, O'Hara Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 20, 1977, Ser. No. 843,770

Int. Cl.[2] G01V *5/00;* **G01N** *21/24;* **G21K** *3/00*

U.S. Cl. 250—255 **9 Claims**

1. The method of determining the quantity of uranium in a material with apparatus including K-edge filtering means and radiometric means, the said method comprising, transmitting through said K-edge filtering means the radioactive radiation from said material to derive from said filtering means resulting radiation substantially only radiation of a selected energy line of the spectrum of the radioactive radiation of said material, and subjecting said radiometric means to said resulting radiation, measuring the magnitude of said resulting radiation to measure said quantity of uranium.



4,158,770

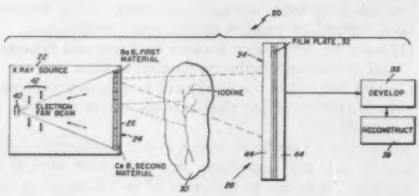
RADIOGRAPHIC IMAGING SYSTEM

Luther Davis, Jr., Wayland, Mass., and Harrison H. Barrett, Tucson, Ariz., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1978, Ser. No. 866,892

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—272 **12 Claims**



1. A radiographic system for imaging a subject having a substance which preferentially absorbs radiation at a predetermined frequency comprising:

a source of radiation from the class of radiation consisting of X and gamma radiation, such source having a first material for emitting such radiation having a frequency lower than said predetermined frequency and situated in a plurality of spaced apart locations about said source, said source having a second material for emitting such radiation having a frequency higher than said predetermined frequency and situated in a plurality of spaced apart locations corresponding to the spaces between the locations of the first material, the locations of said first material forming a first pattern, the locations of said second material forming a second pattern similar to said first pattern, said source being positioned to illuminate said subject;

a detector of said radiation, said subject being positioned between said source and said detector, said detector detecting radiation propagating through said subject, the pattern of a material of said source producing a coded representation of said subject on said detector; and

means operative with said detector for decoding said representation to produce an image of said subject.

4,158,771

ION FILTER AND METHOD OF MAKING THE SAME

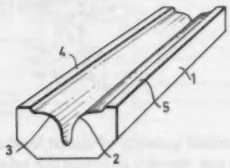
Udo Beeck, Erftstadt, and Andreas Kluge, Cologne, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Jun. 7, 1977, Ser. No. 804,359

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1976, 2625660

Int. Cl.[2] B01D *59/44*

U.S. Cl. 250—294 9 Claims



1. A method of making an ion filter having an electrically insulating body formed of at least two longitudinal parts and having metallized inner faces of generally hyperbolic cross-sectional shape; comprising the following steps:

(a) making longitudinal body segments constituting said longitudinal parts;

(b) grinding the longitudinal body segments to the predetermined cross-sectional shape;

(c) metalllzing those ground surface portions of each longitudinal body segment that are to serve in the ion filter as inner electrode faces for generating electric fields of predetermined configuration; and

(d) shrinking bracing rings onto the outer circumference of the assembled longitudinal body segments subsequent to the metallizing step for securing said longitudinal body segments to one another.

4,158,772

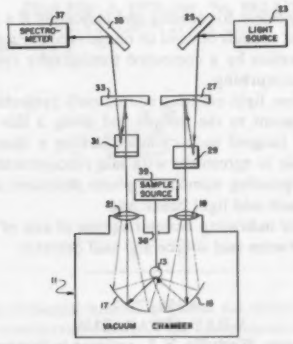
DEVICE FOR COLLECTING AND ANALYZING MATRIX-ISOLATED SAMPLES

Gerald T. Reedy, Lemont, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 2, 1978, Ser. No. 902,185

Int. Cl.[2] G01T *1/00*

U.S. Cl. 250—338 10 Claims



1. A sample collection device for isolating a plurality of distinct samples each in a separate matrix for spectrometric examination comprising:

an enclosed vacuum chamber and means for evacuating gases from said chamber;

a specular sample block rotatably supported on its longitudinal axis within said vacuum chamber, said sample block having a plurality of external, reflecting surfaces;

inlet means for depositing and solidifying sample material intermixed within matrix material onto the reflecting surfaces of the sample block;

a first optical window within the wall of said enclosed vacuum chamber for admitting a beam of electromagnetic radiation into said chamber and a second optical window disposed within the vacuum chamber wall for transmitting electromagnetic radiation that has interacted with a sample from the chamber;

rotational means comprising a stationary shaft supporting said sample block along its longitudinal axis and a rotational drive engaging said block for rotating it in respect to the stationary shaft, said rotational means being capable of positioning individual reflecting surfaces for sample deposition and for spectroscopic examination; and

spectrometric means for providing a beam of electromagnetic radiation to said first optical window and thereby through said sample material on a reflecting surface of the sample block and for examining electromagnetic radiation from said second optical window to determine spectral characteristics of said sample material.

4,158,773

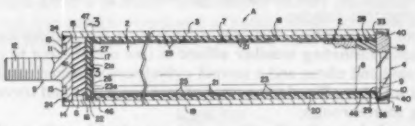
SHOCK-RESISTANT SCINTILLATION DETECTOR

William P. Novak, Middlefield, Ohio, assignor to Bicron Corporation, Newbury, Ohio

Continuation-in-part of Ser. No. 700,406, Jun. 28, 1976, abandoned. This application Jul. 29, 1977, Ser. No. 820,107

Int. Cl.[2] G01T *1/20*

U.S. Cl. 250—361 R 31 Claims



1. A shock-resistant scintillation detector comprising an elongated container containing a large elongated scintillation crystal of an alkali metal halide, said crystal being coaxial with said container and extending along the length of the container, cushioning means disposed between the internal surface of said container and the peripheral surface of said crystal for supporting the crystal and cushioning transverse movements thereof, a transparent window closing one end of said container and spaced from one end of said crystal, a closure member at the opposite end of said container spaced from the other end of said crystal, a yieldable elastic member located between said closure member and said last-named other end, and a flexible elastomeric optical coupling member located between and bonded to said crystal and said window, said coupling member having a diameter no more than about four times its axial thickness and having a high light transmittance at a wavelength of 3000 to 5000 Angstroms, said elastic member having substantially more resistance to compression than said optical coupling member so that more force is required to compress said elastic member a given distance than to stretch said coupling member the same distance, whereby the crystal is protected against tensile force fracture.

4,158,774

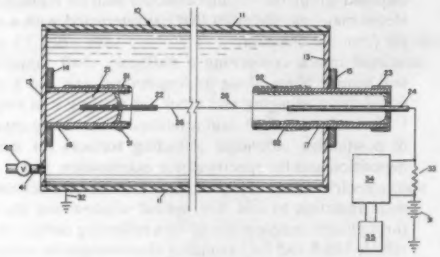
RADIATION DETECTOR WITH IMPROVED PERFORMANCE CHARACTERISTICS

Arthur J. Stokes, Stokes La., Hudson, Ohio 44236

Continuation of Ser. No. 601,223, Aug. 1, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 750,117

Int. Cl.[2] G01T *1/18*

U.S. Cl. 250—374 2 Claims



1. A radiation detector of the gas-filled counter tube type having a sensitive volume, comprising:

a. a conducting cylinder;

b. end plates attached to said conducting cylinder sealing same;

c. anode insulating supports affixed to said end plates;

d. an anode coaxially extending through said conducting cylinder, said anode being fixedly attached to said anode insulating supports;

e. means for communicating with and for evacuating said conducting cylinder and filling same with a suitable filler gas for radiation detection;

f. circuit means operatively connecting a source of suitable direct current potential to said anode and said conducting cylinder; and

g. an electrically conductive coating on said insulating supports in proximity to said sensitive volume and in electrical communication with said anode and electrically isolated from said conducting cylinder, said electrically conductive coating preventing the accumulation of electrical charge on said insulating supports in proximity to said sensitive volume;

said anode insulating supports comprising a first cylindrically shaped insulating member affixed at one end thereof to one of said end plates and a second cylindrically shaped insulating member affixed to another of said end plates and traversing therethrough;

said anode being fixedly attached to one of said anode insulating supports by means comprising an axially disposed conducting rod having fixedly attached to one end thereof said anode;

a binder material disposed within said other anode insulating support and in contact with said conducting rod so as to establish a mechanical connection therebetween.

4,158,775

HIGH RESOLUTION THRESHOLD PHOTOELECTRON SPECTROSCOPY BY ELECTRON ATTACHMENT

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Ara Chutjian, Los Angeles, and Joseph M. Ajello, Arcadia, both of Calif.

Filed Nov. 30, 1977, Ser. No. 856,466

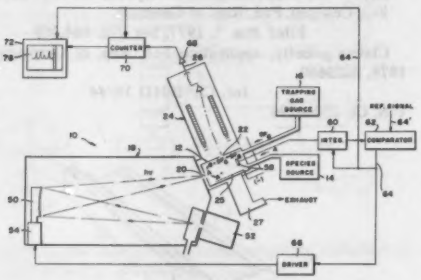
Int. Cl.[2] B01D *59/44;* B01J *39/34*

U.S. Cl. 250—423 P 10 Claims

1. A method for detecting the stability of energy states of a gaseous species, comprising:

adding a trapping gas which absorbs electrons only of a narrow energy band, to said species;

applying photo ionizing energy of a controlled level to said species to cause said species to lose an electron so that the electron can be absorbed by at least a component of said trapping gas if the electron has an energy within said narrow band; and



detecting the ionized quantity of said at least a component of said trapping gas, thereby to detect the relative stability of the species when raised to an energy level equal to the ionizing energy minus the electron energy band.

4,158,776

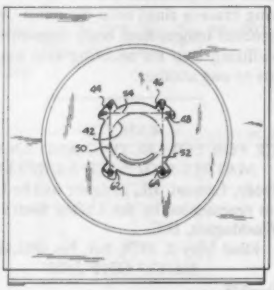
PATIENT SENSING AND INDICATING ARRANGEMENT FOR A COMPUTED TOMOGRAPHY SYSTEM

David M. Barrett, Brookfield, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Nov. 3, 1977, Ser. No. 848,276

Int. Cl.[2] A61B *6/02*

U.S. Cl. 250—445 T 10 Claims



1. An arrangement for sensing and indicating if a cross-section of a patient extends beyond an image reconstruction circle during examination by a computed tomography system, said arrangement comprising:

(a) at least one light emitting source each projecting a light beam adjacent to the patient and along a line which is generally tangent to a cylinder having a diameter and central axis in agreement with said reconstruction circle;

(b) a corresponding number of photo detectors aligned to receive each said light beam; and

(c) means for indicating an interruption of any of said light beams between said source and said detector.

4,158,777

X-RAY APPARATUS

William F. Hogan, Westville, N.J., assignor to Spectrum X-Ray Corporation, Westville, N.J.

Filed Dec. 28, 1977, Ser. No. 865,172

Int. Cl.[2] G03B *41/16*

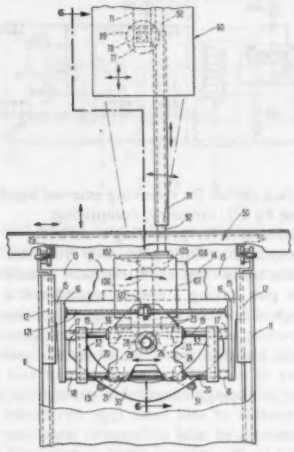
U.S. Cl. 250—445 R 5 Claims

1. A X-ray examination system which includes among its components an X-ray source, an image amplifier, and a patient

supporting table positioned between the X-ray source and the image amplifier, the arrangement being such that the axis of the X-ray beam is perpendicular to the plane of the image amplifier;

a. means for mounting the image amplifier for pivotal movement about an axis which is movable in a direction having a component lateral to the axis of the X-ray beam;

b. means for mounting the X-ray source for pivotal movement about an axis which is movable in a direction having a component lateral to the axis of the X-ray beam; and



c. means for interconnecting the image amplifier and X-ray source such that, in response to lateral and angular movement of the image amplifier on its axis, the X-ray source is simultaneously moved angularly and laterally, the angular movement corresponding to the angular movement of the image amplifier, and the component of lateral movement being in a direction opposite to the component of lateral movement of the image amplifier.

4,158,778

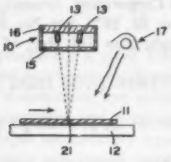
OPTOELECTRONIC SCANNING DEVICE

George E. Gard, Lancaster; Elvin K. Manning, Mountville; Werner Rueggeberg, and Kerry L. Weinhold, both of Lancaster, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Mar. 1, 1978, Ser. No. 882,327

Int. Cl.[2] G01N *21/38, 23/00*

U.S. Cl. 250—461 R **4 Claims**



1. A photoelectric scanning system for detecting luminous marks on boards conveyed past the components of the system, comprising:

(a) a first row of phototransistors aligned to be responsive over a collinear array of equally spaced domains;

(b) a second row of phototransistors mounted adjacent to and alongside said first row of phototransistors, said second row of phototransistors adjusted to operate at a lower detection level than said first row of phototransistors and aligned to be responsive over a collinear array of equally spaced domains disposed between and contiguous with the domains over which said first row are responsive, thereby providing that alternate domains are responsive at different detection levels;

(c) an ultraviolet lamp for illuminating materials to be scanned by said phototransistors;

(d) a heater including a temperature controller mounted on said phototransistor array for maintaining said array at a constant elevated temperature; and

(e) a trigger circuit having transistor components for correcting the output of said phototransistors into square wave output.

4,158,779

X-RAY SHIELD

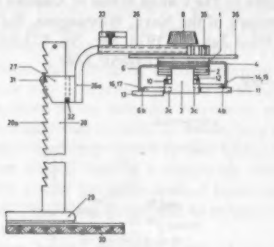
Werner Rommel, and Franz Starp, both of Wildbad, Fed. Rep. of Germany, assignors to Prontor-Werk Alfred Gauthier GmbH, Fed. Rep. of Germany

Filed Nov. 25, 1977, Ser. No. 854,855

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2653998; Oct. 7, 1977, 2745123

Int. Cl.[2] G21F *5/00*

U.S. Cl. 250—515 **15 Claims**



1. Shielding device for the protection of human embryo cells from the effects of radiation during examination by X-rays comprising a radiant absorbing protective screen including a central radiant absorbing protective plate of predetermined configuration, a plurality of additional radiant absorbing protective displaceable sheets and adjusting means to displace the sheets relative to each other to vary the covering surface area of the screen.

4,158,780

POWER GENERATION SYSTEMS IN BUOYANT STRUCTURES

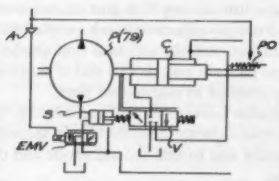
Eric Wood, 42 Haggs Hill Rd., Ossett, West Yorkshire, England

Continuation of Ser. No. 656,042, Feb. 6, 1976, abandoned. This application Apr. 20, 1977, Ser. No. 789,201

Claims priority, application United Kingdom, Feb. 6, 1975, 05196/75; Sep. 10, 1975, 37189/75; Oct. 31, 1975, 45183/75

Int. Cl.[2] F03B *13/10*

U.S. Cl. 290—42 **8 Claims**



1. A power generation system for the generation of electrical power from the wave motions of the sea comprising a spine on which a plurality of ducks are rockably mounted and for each

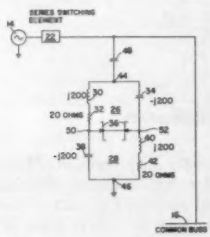
duck a power generation assembly comprising a hydrostatic transmission known per se having a pump connected operatively with a drive wheel means which is rotated back and forth by the rocking motion of the duck, caused by the wave motions of the sea, a variable displacement hydraulic motor hydraulically coupled to the pump so as to be driven by the pump, an electrical generator operatively connected to the motor to be driven thereby so as to provide output electrical power, and sensing means for sensing the force or velocity condition of a duck for varying the motor displacement in accordance with such condition.

4,158,781

TRANSMIT RECEIVE SOLID STATE SWITCH FOR ELECTROACOUSTIC TRANSDUCERS

Dale D. Skinner, and John H. Thompson, both of Saverna Park, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1978, Ser. No. 873,325
Int. Cl.[2] G05F *1/44*
U.S. Cl. 307—99 **5 Claims**



4. A two terminal switching element comprising:

an input port;

an output port;

a first inductor having first and second ends, said first end of said inductor being coupled to said input port;

a first resistor having first and second ends, said first end being coupled to said second end of said first inductor;

a first capacitor having first and second ends, said first end of said first capacitor being coupled to said input port;

a pair of zener diodes connected back-to-back at their respective cathodes and having a first anode end and a second anode end, said first anode end being coupled to said second end of said first resistor and said second anode end being coupled to said second end of said first capacitor;

a second capacitor having first and second ends, said first end of said second capacitor being coupled to said second end of said first resistor and said first anode end of said zener diode pair and said second end of said second capacitor being coupled to said output port;

a second inductor having first and second ends, said first end of said second inductor coupled to said second end of said first capacitor and to said second anode end of said zener diode pair;

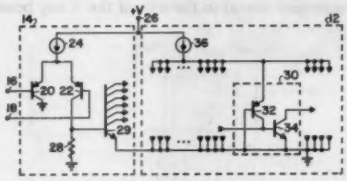
a second resistor having first and second ends, said first end coupled to said second end of said second inductor and said second end of said second resistor coupled to said output port;

4,158,782

I^2L INTERFACE WITH EXTERNAL INPUTS AND METHOD THEREOF

John J. Price, Jr., Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 22, 1977, Ser. No. 826,229
Int. Cl.[2] H03K *19/08, 19/20*
U.S. Cl. 307—213 **8 Claims**



1. An interface circuit for receiving external input signals for subsequent use by I^2L circuitry, comprising:

(a) a current source for providing a current;

(b) a differential transistor pair, each transistor being of a first conductivity type, each transistor of said differential transistor pair having a first, a second and a third electrode, each of said electrodes being of the same type as the corresponding electrode of the other transistor of said differential transistor pair, one of each of said same type electrodes of each of said transistors of said differential transistor pair being connected in common to said current source, another of said same type electrodes of each of said transistors of said differential transistor pair being connected to the external input signals, said differential transistor pair having an output thereof derived from still another one of said electrodes of the same type, said output of said differential transistor pair being for selectively supplying the current provided by said current source; and

(c) a multiple-collector output transistor of a second conductivity type opposite to said first conductivity type disposed in said I^2L circuitry and having an input electrode coupled to said output of said differential transistor pair and being responsive to said selectively supplied current for providing I^2L compatible signal levels at a plurality of collector electrodes of said multiple-collector output transistor for subsequent use by said I^2L circuitry and in response to said external input signals.

4,158,783

CURRENT HOGGING INJECTION LOGIC WITH SELF-ALIGNED OUTPUT TRANSISTORS

Horst H. Berger, Sindelfingen, and Siegfried Wiedmann, Stuttgart, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 10, 1977, Ser. No. 823,314
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1976, 2652103
Int. Cl.[2] H01L *27/04;* **H03K** *19/08*
U.S. Cl. 307—213 **9 Claims**

7. An integrated circuit for providing logic functions, comprising:

a semiconductor body portion of one conductivity type having a major surface,

a plurality of regions of opposite conductivity type formed in said body portion at said major surface,

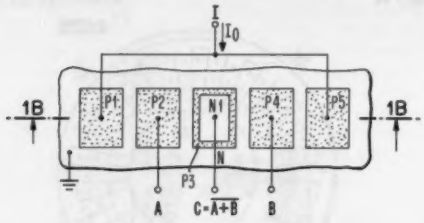
said plurality of regions including an injector region, at least one output base region, and at least one control collector region, said at least one control collector region being so disposed between said injector region and said output base region as to intercept minority carriers in said body portion passing from said injector region to said output base region,

a single output collector region of said one conductivity type formed at said major surface within said output base region,

said output base region forming an output transistor base-emitter junction with said body portion,

said output collector region forming an output transistor base-collector junction with said output base region,

the distance in any direction along said major surface between said output base-collector junction and said output base-emitter junction being substantially no greater than the maximum distance from said major surface to said output base-emitter junction,



power supply terminals connected to said body portion and said injector region,

an input terminal connected to said control collector region, and,

an output terminal connected to said output collector region.

4,158,784

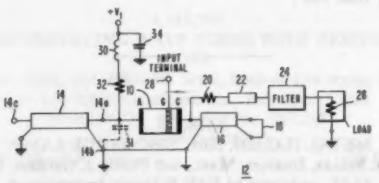
PULSE TRAIN GENERATOR

Walter R. Curtice, West Windsor Township, Mercer County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,191

Int. Cl.[2] H03K *3/357, 3/64*

U.S. Cl. 307—260 **11 Claims**



1. A circuit for producing a pulse train at a fundamental frequency and at least one harmonic frequency, comprising:

a two conductor transmission line substantially non-dispersive at said fundamental and harmonic frequencies, said line having a length substantially equal to one half of the wavelength therein associated with said fundamental frequency, said line being open circuited at one end and short circuited at the other end;

an active device coupled in series in said line at a point removed from said ends and being operable to exhibit negative resistance at said fundamental and harmonic frequencies; and

an output terminal coupled to said transmission line at a point between said active device and said short circuited end for providing a signal at said fundamental and harmonic frequencies.

4,158,785

PULSE REGULATION DELAY LINE MODULATOR

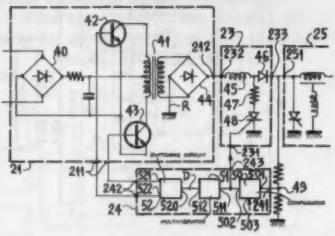
Jean P. Desaintfuscien, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 4, 1977, Ser. No. 839,382

Claims priority, application France, Oct. 5, 1976, 76 29894

Int. Cl.[2] H03K *1/18*

U.S. Cl. 307—265 **3 Claims**



1. A pulse regulation delay line modulator comprising a high voltage power supply converter circuit, a load circuit and a regulating circuit for the control of delay line load voltage, wherein said load circuit comprises a switchable fast locking circuit including an induction coil having an input coupled to said load circuit input and an output coupled to a diode and to a clamping circuit, said clamping circuit comprising a resistor coupled in series with a thyristor the free switching electrode of which is coupled to its potential reference, said thyristor having a control electrode coupled to a switching input of said load circuit, said regulating circuit further comprising:

a comparator circuit having a triggering threshold, said comparator circuit having a control input coupled to an input of said regulating circuit and an output coupled to an input of said load circuit;

a multivibrator having an input terminal coupled to said output of said comparator, said multivibrator having an output delivering rectangular signals; and

a switching circuit having an input and two outputs, said input of said switching circuit being coupled to said output of said multivibrator and said two outputs of said switching circuit being coupled to said input controlling said converter circuit.

4,158,786

DISPLAY DEVICE DRIVING VOLTAGE PROVIDING CIRCUIT

Masataka Hirasawa, Ayase, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Jul. 22, 1977, Ser. No. 818,295

Claims priority, application Japan, Jul. 27, 1976, 51-89462; Aug. 3, 1976, 51-92454

Int. Cl.[2] H03K *1/00;* G06F *3/14*

U.S. Cl. 307—296 R **17 Claims**

1. A circuit for providing a plurality of potential levels used in dynamically driving a display device comprising:

first and second input terminals for receiving maximum and minimum input potentials, respectively;

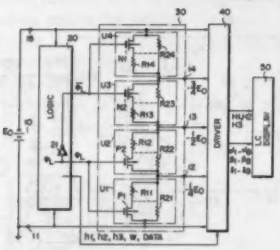
a series connection of resistive elements, said connection having a terminal at each end thereof and at least one intermediate junction point;

a first field effect transistor for connecting one end terminal of said series connection to said first input terminal, and a second field effect transistor for connecting the other end terminal of said series connection to said second input terminal;

means for simultaneously enabling and disabling said first and second field effect transistors, so that a current flows from one of said first and second input terminals to the other of said first and second input terminals through said first and second field effect transistors and said series

connection of resistive elements when said first and second field effect transistors are enabled;

said enabling and disabling means enabling said first and second field effect transistors for a period of time shorter than the period said field effect transistors are disabled; and



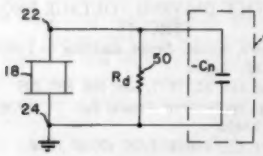
at least first, second and third output terminals, said first and second output terminals being connected to said first and second input terminals, respectively, to provide maximum and minimum potential levels, and said third output terminal being connected to an intermediate junction point of said series connection to provide a predetermined intermediate potential level between the maximum and minimum potential levels.

4,158,787

ELECTROMECHANICAL TRANSDUCER-COUPLED MECHANICAL STRUCTURE WITH NEGATIVE CAPACITANCE COMPENSATION CIRCUIT

Robert L. Forward, Oxnard, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 8, 1978, Ser. No. 904,169
Int. Cl.[2] H01L *41/10*; H02K *5/24*
U.S. Cl. 310—51 **7 Claims**



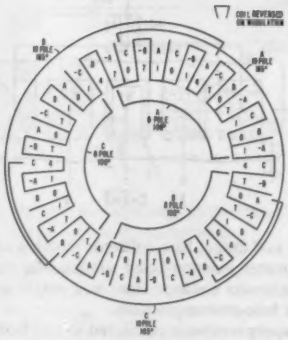
1. In an electromechanical system including a mechanical member which is subject to vibrational movement and an electromechanical transducer mounted on said member and providing between first and second terminals an electrical signal responsive to said vibrational movement, electrical circuit means coupled between said first and second terminals for providing a negative capacitance of a value cancelling a substantial portion of the capacitance inherent in said electromechanical transducer; said electrical circuit means including an operational amplifier having a non-inverting input terminal an inverting input terminal, and an output terminal; said non-inverting input terminal being coupled to said first terminal; a capacitor coupled between said non-inverting input terminal and said output terminal; and a potentiometer coupled between said output terminal and said second terminal and having a moveable tap coupled to said inverting input terminal.

4,158,788

SPECIAL MOTOR WINDINGS FOR THE SUPPRESSION OF A SPECIFIC HARMONIC BY EXPANDING THE ELECTRICAL ANGLE OF PHASE BELTS

Gurney L. Godwin, Georgetown, Tex., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 27, 1977, Ser. No. 837,231
Int. Cl.[2] H02K *3/00*
U.S. Cl. 310—198 **9 Claims**



1. A rotary electric machine having a three phase alternating current winding adapted to provide alternative pole numbers by alternating modes of operation, said alternate current winding being arranged for operation in a normal, unmodulated, mode to provide p poles distributed among a plurality of phase belts having an electrical angle of δ, which is less than 120° and in which, for all three phase windings, consecutive poles are arranged for operation in an alternative, modulated, mode in which, for one phase winding, at least part of one-half of the phase winding is reversed in polarity relative to the corresponding part of the other half of the same phase winding, whereby an amplitude modulated magnetomotive force field is established which combines a field component of p+2k poles and a field component of p−2k poles, where k is an integer and the second and third phase windings are, arranged to provide second and third amplitude modulated fields also combining a field component of p+2k poles and a field component of p−2k poles and an expanded electrical angle for said phase belts of β greater than 120°.

4,158,789

METAL HALIDE ARC DISCHARGE LAMP

John A. Scholz, Danvers, Mass., and Phillip J. Gardner, Cupertino, Calif., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 12, 1977, Ser. No. 859,275
Int. Cl.[2] H01J *61/06*
U.S. Cl. 313—218 **3 Claims**

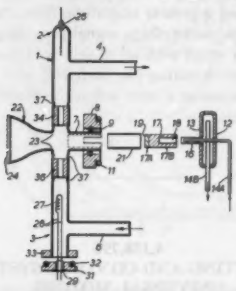
1. An ultraviolet emitting arc discharge lamp comprising an arc tube having tungsten electrodes at each end and containing a fill including mercury, iron in the form of iron halide and a starting gas, the tungsten electrode containing a small quantity of iron, wherein the small quantity of iron is in solid solution with the tungsten.

4,158,790

HIGH INTENSITY ATOMIC SPECTRAL LAMP WITH INTERCHANGEABLE CATHODE

John V. Sullivan, Carnegie, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Jun. 7, 1977, Ser. No. 804,475
Claims priority, application Australia, Jun. 7, 1976, PC6196
Int. Cl.[2] H01J *1/94, 37/34, 61/06, 61/52*
U.S. Cl. 313—231.6 16 Claims



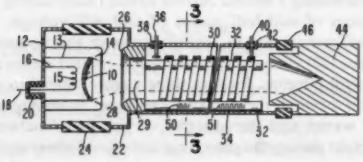
1. A high intensity atomic spectral lamp having a hollow body, a first set of electrodes located in said body including a primary cathode comprising a selected element adapted to produce a primary electric discharge which gives rise to an atomic vapour of said element by cathodic sputtering from the primary cathode; a second set of electrodes located in said body adapted to produce a secondary electric discharge which passes through said atomic vapour, to excite the atoms in the vapour to emit radiation characteristic of said element; a window in said body to allow the passage of said radiation out of the lamp, said window being placed in front of and substantially parallel to the operative surface of the primary cathode; a gas inlet and outlet means in said body to pass a stream of inert gas through said body of said lamp transversely across and substantially parallel to the operative surface of the primary cathode and between the primary cathode and the window in such a manner as to sweep away from the area between the primary cathode surface and the window atomic species formed by said primary discharge.

4,158,791

HELIX TRAVELING WAVE TUBES WITH RESONANT LOSS

Erling L. Lien, and Allan W. Scott, both of Los Altos, Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 10, 1977, Ser. No. 767,239
Int. Cl.[2] H01J *25/34*
U.S. Cl. 315—3.5 18 Claims



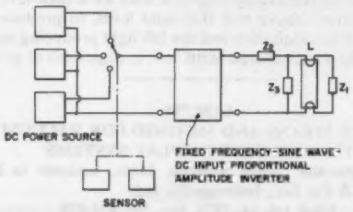
1. In a traveling wave tube comprising a helix-type slow wave interaction circuit supported by dielectric support rod extending in the direction of propagation, frequency sensitive loss means for absorbing wave energy flowing on said interaction circuit within a certain range of frequencies, said loss means comprising resistive conductor means affixed to a dielectric support member and shaped to form a resonant slow-wave circuit extending in said direction of propagation with wave-reflective ends.

4,158,792

LIGHT CONTROL DEVICE FOR HIGH FREQUENCY LIGHTED FLUORESCENT LAMP

Hisashi Kuroi, Kyoto; Masamichi Hatada, Uji; Kumio Morita, Komatsu, and Eiji Tanaka, Kyoto, all of Japan, assignors to Kuroi Kosan Kabushiki Kaisha, Kyoto, Japan

Filed Oct. 14, 1977, Ser. No. 842,338
Claims priority, application Japan, Oct. 15, 1976, 51-124024
Int. Cl.[2] H05B *37/00, 41/29*
U.S. Cl. 315—86 13 Claims



1. A light control device for a high frequency lighted fluorescent lamp, comprising: a high frequency variable voltage power source, a first impedance element provided on both terminals of a fluorescent lamp on the side opposite to said power source, a constant power source circuit which supplies, upon starting of the lamp, a constant power to said first impedance element to thereby apply substantially constant cathode pre-heating current and starting voltage and applies, during lighting of the lamp, substantially constant cathode heating current by the lamp voltage, and capable of pre-set light control.

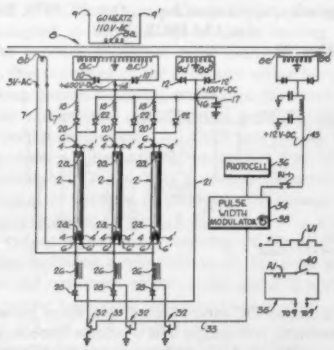
12. The light control device for high frequency lighted fluorescent lamp as defined in claim 1, wherein the high frequency variable voltage power source comprises variable output (output-switchable) DC sources controlled by a sensor and a fixed frequency - sine wave - input proportional amplitude inverter, and having a function of an emergency lamp.

4,158,793

GAS DISCHARGE LAMP CONTROL CIRCUIT

Gary D. Lewis, 22325 Bon Heur, St. Clairs Shores, Mich. 48081

Filed Jul. 11, 1977, Ser. No. 814,383
Int. Cl.[2] H05B *41/30, 41/392*
U.S. Cl. 315—101 14 Claims



1. A circuit for operating a gas discharge lamp having terminal means to which ionizing voltage sources are to be con-

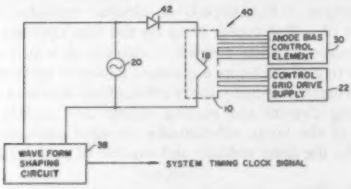
nected and which has a gas which ionizes at a very low non-light producing level when a relatively small amount of current is fed therethrough and which ionizes at a relatively high level to produce substantial visible light when current flow therethrough is raised above a given threshold level, said circuit comprising: a pair of gas discharge lamp connecting terminals to which said terminal means of said gas discharge lamp are to be connected, means for continuously applying a low level gas ionization producing current across said pair of connecting terminals when lamp turn-off is desired to effect the striking of an arc within the gas discharge lamp and the flow of a very low current below said threshold level to produce continuously said low degree of gas ionization, and manually operable lamp turn-on initiating and sustaining switch means for replacing the low level gas ionization producing current across said connecting terminals by a high level gas ionizing current above said threshold level, to produce said high level of gas ionization and the full light producing energization of the gas discharge lamp.

4,158,794

DRIVE MEANS AND METHOD FOR VACUUM FLUORESCENT DISPLAY SYSTEMS

Louis M. Sandler, North Reading, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Jul. 14, 1978, Ser. No. 924,578
Int. Cl.[2] H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169.1 **15 Claims**



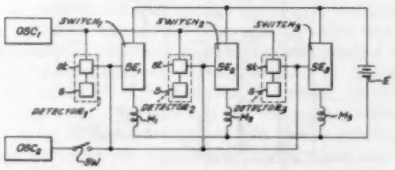
1. A drive circuit for a vacuum display system having a plurality of sequentially illuminable elements, comprising means for controlling application of heating power to said display system during sequential illumination of said elements whereby variation in luminous intensity from one element to another is substantially eliminated.

4,158,795

BRUSHLESS DC MOTORS

Kenkichi Tarumi, and Junichi Kanamori, both of Tokyo, Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1977, Ser. No. 845,618
Claims priority, application Japan, Oct. 30, 1976, 51-130784
Int. Cl.[2] H02K *29/00*
U.S. Cl. 318—138 **4 Claims**



1. In a brushless DC motor including a stator having a plurality of magnetic pole pieces and windings thereon, a permanent magnet rotor, and a switching circuit for controlling the feed of DC current to respective windings and having a plurality of transistors which are connected in series with said windings, respectively, a plurality of inductors for detecting an angular position of said rotor and disposed in spaces between adjacent pole pieces along the rotor surface, respectively, each of said inductors being connected to a base of a corresponding one of said transistors, and a first high-frequency oscillator for providing a high-frequency signal to said plurality of inductors, each one of said plurality of inductors developing a signal to turn on the corresponding transistor at a time when said inductor faces a predetermined pole of said permanent magnet rotor,

an improvement comprising

a means for providing a voltage signal with the same frequency as, and a greater amplitude than, the signals from said inductors, said voltage signal providing means being connected in series with all of said inductors, and

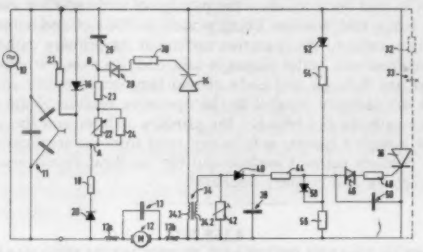
means for short-circuiting the output of said voltage signal providing means at a time when the motor is to be forwardly driven.

4,158,796

SPEED SETTING AND CONTROL SYSTEM FOR UNIVERSAL MOTORS

Wolfgang Kosak, Moglingen; Peter Werner, Stuttgart, both of Fed. Rep. of Germany; Hans Gerber, Luterbach, and Ivan Hidveghy, Zuchwil, both of Switzerland, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 908,985
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724815
Int. Cl.[2] H02P *5/40*
U.S. Cl. 318—245 **16 Claims**



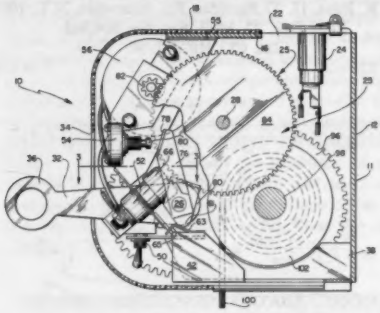
1. In a speed setting and control system for an AC motor, said system having a source of AC voltage (**10**), speed setting means (**14–30**) connected to said source of AC voltage and said motor, for furnishing a first current to said motor during alternate half waves of said AC voltage, and speed control means (**36, 44–58**) connected to said source of AC voltage and said motor, for furnishing a second current to said motor during the remaining ones of said half waves of said AC voltage, the improvement comprising, in accordance with the invention, storage means (**38**) connected to said speed control means and said speed setting means, for furnishing a stored signal to said speed control means at the start of each of said remaining ones of said half waves, said stored signal varying as a function of the first current during the preceding one of said alternate half waves;

and wherein said speed setting means comprises adjustable timing means (**22,23,26**) separate from, and operative independently of, said storage means, for changing a characteristic value of said first current under external control until said motor operates at a selected speed, whereby the minimum speed settable by said adjustable timing means is independent of residual charge on said storage means.

4,158,797
POWER HOIST

David K. Alcott, Rehoboth, Mass., assignor to Haulamatic Corporation, East Providence, R.I.

Filed Feb. 22, 1977, Ser. No. 770,986
Int. Cl.[2] H02P *3/10, 3/14*
U.S. Cl. 318—371 3 Claims



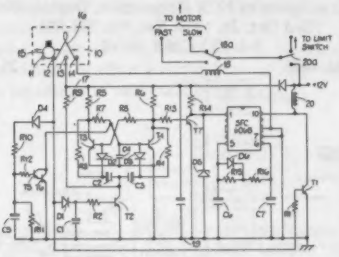
1. A power hoist comprising a motor, a rotatable cable shaft, a gear drive operably interconnecting said motor with said shaft, an operating lever movable between haul, brake and lock positions of said shaft, a shunt switch connected across said motor and operable in both said brake and lock positions of said shaft to shunt brake said motor, locking means for interengaging said gear drive, and separate second switch means for energizing said motor, said lever including means operable in said haul position to activate said second switch while deactivating both said shunt switch and said locking means, said lever means further operable in said brake position to de-activate both said second switch and said locking means while activating said shunt switch, said lever means still further operable in said lock position to de-activate said second switch while activating both said shunt switch and said locking means, said lever mounted on a fixed control shaft for relative partial rotation thereon, a bracket connected to said lever and also mounted on said control shaft for relative rotation therewith in conjunction with said lever, said bracket having first and second outwardly extending switch engaging portions, said first portion contacting said second switch to actuate same to energize said motor and said portion contacting said shunt switch to actuate same to de-energize said shunt brake when said lever is positioned in haul position, said first portion making contact with said second switch just after said second portion contacts said shunt switch when said lever moves from brake to haul position whereby when said lever moves back from haul to brake position, said shunt switch is energized just after said motor is de-energized.

4,158,798
CONTROL CIRCUITS FOR WINDSCREEN WIPERS FOR ROAD VEHICLES

William D. Holt, Colne, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jul. 7, 1977, Ser. No. 813,703
Claims priority, application United Kingdom, Jul. 8, 1976, 28418/76
Int. Cl.[2] H02P *1/04;* B60S *1/08*
U.S. Cl. 318—444 5 Claims

1. A windscreen wiper control circuit comprising the combination of a control switch assembly including main contacts associated with detent means for selecting normal operation and a further contact without detent means for selecting flick-wipe or intermittent operation, a pulse length recognition circuit means, operable by the further contact, for operating said wipers in the flick-wipe mode or the intermittent mode

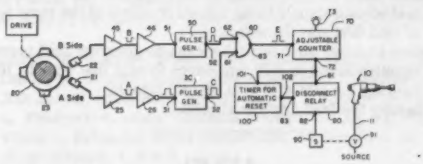


according to the length of time for which the further contact is closed.

4,158,799
SCREWING TOOL FOR PRINTING PRESSES

Bert Cappel, and Alfred Dorn, both of Lammerspiel, Fed. Rep. of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG., Fed. Rep. of Germany

Continuation-in-part of Ser. No. 807,579, Jun. 17, 1977, abandoned. This application Aug. 2, 1977, Ser. No. 821,085
Int. Cl.[2] G05G *5/00*
U.S. Cl. 318—626 8 Claims

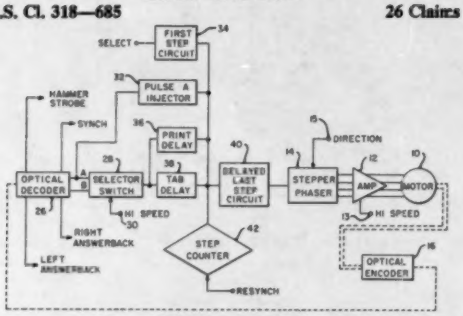


1. In a control system for a screwing tool having a source of power with trigger means on the tool for selectively producing rotation in opposite directions for tightening and loosening screws in a printing press or the like, the combination comprising a pair of angularly spaced pick-up devices coupled to the shaft of the tool for generating respective series of impulses, one of the pick-up devices being in leading position to produce impulses of leading phase during counterclockwise rotation while the other is in trailing position, monostable pulse generators coupled to the respective pick-up devices, the generator which is coupled to the pick-up device in leading position being set to produce an output pulse which is substantially wider than that produced by the generator which is connected to the pick-up device in trailing position so that during counterclockwise rotation the output pulses from the generators timingly overlap one another, an AND gate having its input terminals connected to the pulse generators and having an output terminal, means including a counter connected to the output terminal of the gate for counting the pulses resulting from counterclockwise rotation of the shaft and for producing a counter output signal upon reaching of a predetermined count, means including a relay having its input connected to the counter and responsive to the output signal therefrom and having its output interposed between the source and the tool for turning off the tool when the predetermined count is reached, the predetermined count being sufficiently low to insure that the screw is only partially unscrewed from its tight condition, and means for resetting the relay in readiness for engagement of a succeeding screw.

4,158,800
CONTROL SYSTEM

James R. Jahelka, Wichita, and Edward D. Bemis, Derby, both of Kans., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 26, 1976, Ser. No. 735,722
Int. Cl.[2] G05B *19/40*
U.S. Cl. 318—685 26 Claims



1. A control system, comprising:

rotatable means having a plurality of windings to which driving pulses are applied in a certain sequence to cause said rotatable means to rotate, said rotatable means being variably operable in accordance with variations in the lead angle between energized windings and the rotational position of the rotatable means;

first means for providing first signals related to the rotation of said rotatable means, each of said first signals having a leading edge and a trailing edge;

second means for providing second signals to said windings, said second signals being related to edges of the same type of said first signals; and

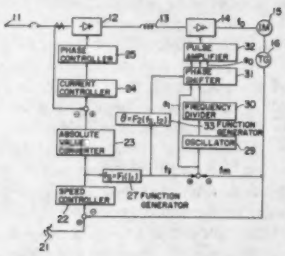
means to cause said second means to generate said second signals related to different edges fo said first signals, thus varying the phase of said second signals,

whereby the lead angle is altered.

4,158,801
CONTROL SYSTEM OF ALTERNATING CURRENT MOTORS

Akio Hirata, Koganei, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Feb. 7, 1978, Ser. No. 875,876
Int. Cl.[2] H02P *7/36*
U.S. Cl. 318—801 6 Claims

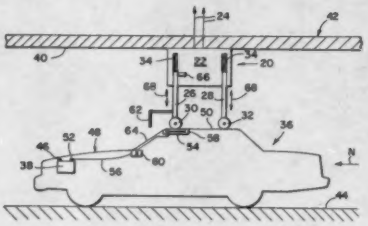


1. In a control system of an alternating current motor energized by a current control frequency converter of the class wherein the speed of the motor is controlled by varying the phase of the output current of the frequency converter by shifting the phase of a control signal of said frequency converter, the improvement which comprises a function generator supplied with a first signal including a speed control signal form by a speed controller in response to an actual speed of said motor and a speed reference signal for generating a second signal corresponding to the phase of a primary current of said motor, and a phase shifter for shifting the phase of said control signal in accordance with said second signal.

4,158,802
RECHARGEABLE BATTERY POWERED ELECTRIC CAR AND RECHARGING STATION THEREFOR

William R. Rose, II, 77 Sheridan Rd., Scarsdale, N.Y. 10583

Filed Dec. 27, 1977, Ser. No. 864,542
Int. Cl.[2] H02J *7/00*
U.S. Cl. 320—2 6 Claims

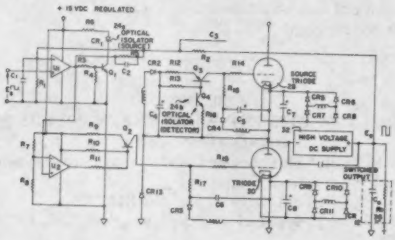


1. A power source station comprising electrodes for supplying electric power for recharging rechargeable electric batteries in combination with a vehicle comprising a main body portion including at least one rechargeable electric battery comprising electrodes, characterized in that the power source station is fixed to holding means associated with vehicle parking means and comprises at least one pair of spaced electrodes movably extendible toward said parking means and said vehicle comprises at least one battery recharge circuit portion grounding one battery electrode to the main frame of the vehicle and another battery recharge circuit portion connecting another battery electrode to an insulated surface portion of the vehicle; whereby when the vehicle is moved onto said parking space one of said power source electrodes will be urged into contact with said grounding portion of the vehicle frame and the other of said power source electrodes will be urged into contact with said insulated surface portion of the vehicle.

4,158,803
SWITCHING HIGH VOLTAGE POWER SUPPLY

John G. Berger, Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 29, 1977, Ser. No. 838,036
Int. Cl.[2] G05F *1/52*
U.S. Cl. 323—21 3 Claims



1. A switchable high voltage d-c power supply capable of rapidly switching between voltage states in response to a variably controllable low level reference voltage input to drive a device having a large capacitance comprising, in combination:

a high output voltage source;

a high voltage/optical isolator having a source portion and

an optical detector portion which is connected to said high output voltage source;

a first high voltage/frequency planar triode connected to apply said high output voltage source to the large capacitance device;

a second high voltage/frequency planar triode connected as a sink to the large capacitance device;

output sensing means connected to detect an output voltage across the large capacitance device, said output sensing means having voltage dividing means for scaling down the output voltage to an analogous lower voltage;

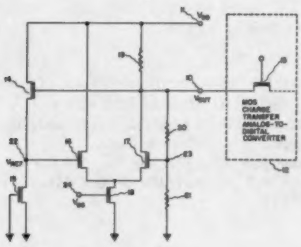
a source error amplifier shunt comparator connected to said output sensing means and connected to receive the reference voltage input for comparing said analogous lower voltage with the reference voltage, said comparator being further connected to control the operation of said first triode through said optical isolator and to control the operation of said second triode on the basis of the comparison between said analogous voltage and the reference voltage.

4,158,804

MOSFET REFERENCE VOLTAGE CIRCUIT

Walter J. Butler, Scotia, and Charles W. Eichelberger, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 10, 1977, Ser. No. 823,383
Int. Cl.[2] G05F *1/56*
U.S. Cl. 323—22 R **12 Claims**



1. A circuit for providing a stable reference output voltage at an output terminal, comprising, in combination: a supply voltage source; first circuit means connected to said supply voltage source and to said output terminal for producing a first voltage which does not vary due to changes in temperature; and differential circuit means connected to said first voltage for producing a second voltage at said output terminal which is constant despite fluctuations of supply voltage; said differential circuit means consisting of a single current source means and first and second parallel transistor means each connected in series with said current source means; said first voltage being connected to the gate of said first transistor means; resistive feedback circuit means connecting said second voltage to a gate electrode of said second transistor means; and resistor means in series only with said second transistor means and connected between said supply voltage source and said second voltage at said output terminal.

4,158,805

METHOD AND APPARATUS FOR TESTING CRYSTAL ELEMENTS

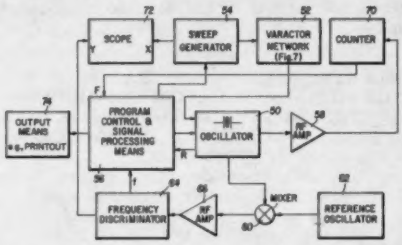
Arthur D. Ballato, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 19, 1978, Ser. No. 870,694
Int. Cl.[2] G01R *29/22*
U.S. Cl. 324—56 **15 Claims**

1. The method of testing for the presence of anomalies in a crystal resonator comprising the steps of:

operating said crystal resonator in an oscillator circuit which is controlled by said crystal resonator and a voltage-variable load capacitance in series therewith at a frequency in the vicinity of the nominal resonance frequency of said crystal resonator;

applying a time-varying sweep control signal to said load capacitance to effect a continuous variation in an operating parameter of said oscillator circuit;



continuously detecting during application of said sweep signal an output signal representative of said operating parameter;

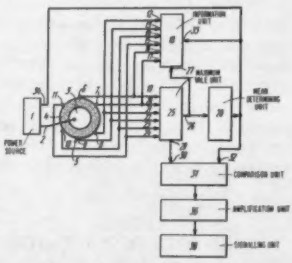
and applying continuously to a visual indicator said sweep control signal and said representative output signal to provide an abrupt change in indication of said indicator when said crystal resonator anomalies occur.

4,158,806

METHOD OF CHECKING THE STATE OF THE LINING OF A MELTING UNIT AND DEVICE FOR EFFECTING SAME

Alexandr M. Kotylev, ulitsa Malaya Schukinskaya, 58, kv. 17; Dmitry A. Gitgarts, ulitsa Petrozavodskaya, 17, korpus 2, kv. 209; Jury S. Ioffe, ulitsa Yaroslavskaya, 1/9, kv. 11; Alexandr A. Prostyakov, ulitsa Veshnyakovskaya, 35/26, kv. 66, and Viktor I. Krizental, ulitsa Lavochkina, 54, korpus 2, kv. 163, all of Moscow, U.S.S.R.

Filed Apr. 20, 1977, Ser. No. 789,079
Int. Cl.[2] G01R *27/02*
U.S. Cl. 324—65 R **10 Claims**



7. A device for checking the state of a lining of a melting unit, comprising: a power source having a first terminal connected to the metal in said melting unit and a second terminal; electrodes uniformly spaced on said lining along the perimeter of said melting unit; a maximum value unit, for determining the maximum value of a parameter being measured, having a group of inputs connected to respective electrodes and first and second outputs; a mean determining unit, for determining the arithmetic mean of the parameter being measured, having an input connected to the first output of said maximum value unit, and an output; an information unit, providing information on the state of said lining and having a group of inputs connected to respective electrodes, a first

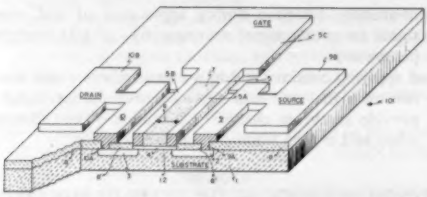
additional input connected to said first output of said maximum value unit, and a second additional input connected to the output of said mean determining unit and to the second terminal of said power source; a comparison unit, for comparing the maximum value and the arithmetic mean of the parameter being measured, having a first input connected to said second output of said maximum value unit, a second input connected to the output of said mean determining unit, and an output; an amplification unit having an input connected to the output of said comparison unit and an output; and a signalling unit having an input connected to the output of said amplification unit.

4,158,807

GAPPED GATE CHARGE-FLOW TRANSISTOR WITH A THIN FILM SENSOR HAVING TWO MODES OF CONDUCTION WITHIN THE GAPPED GATE USED TO SENSE A PROPERTY OF THE AMBIENT ENVIRONMENT

Stephen D. Senturia, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 25, 1977, Ser. No. 790,631
Int. Cl.[2] G01N *27/00*; H01L *29/78, 29/84*
U.S. Cl. 324—71 SN **100 Claims**



1. A charge-flow instrument that comprises in combination: a charge-flow comprising a semiconductor substrate, a source region, a drain region, a gate insulator, gapped gate electrode means comprising a pair of fingers with a gap between the fingers, a thin-film sensor material disposed in said gap and in electrical contact with said fingers, said sensor material having electrical conductance that is sensitive to a property of the ambient environment within which the transistor is located, said sensor material having a surface conductance that differs substantially from the bulk conductance thereof, that is, the sensor material has two modes of conduction, a surface conductance mode and a bulk conductance mode, contacting means comprising a plurality of contacts for making electrical contact to the source region, the drain region, and the gate electrode means, and insulating means to insulate said contacts from the substrate and from each other; and electric monitoring means connected to the said charge-flow transistor and operable to sense any changes wrought in said surface conductance and to relate the surface conductance and changes therein to said property of the ambient environment.

4,158,808

LOAD SOURCE SIMULATOR

Richard L. Massa, Sterling Heights; Robert C. Murray, Troy, and Kenneth J. Cook, Oak Park, all of Mich., assignors to The Valeron Corporation, Oak Park, Mich.

Filed Aug. 18, 1977, Ser. No. 825,745
Int. Cl.[2] G01R *35/00*; G05F *3/00*
U.S. Cl. 324—74 **19 Claims**

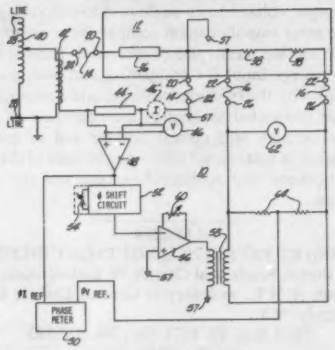
1. Apparatus for simulating large electrical loads in alternating current systems incorporating power meters of the type having separate voltage and current sensing inputs, said apparatus comprising:

a controlled current source operative to generate a selectively variable output alternating current signal having a fixed phase angle;

phase shift means connected to receive said current signal and to generate a reference signal having a phase angle which is selectively variable with respect to the phase angle of said current signal;

a controlled voltage source connected to receive said phase reference signal and to generate a selectively variable output voltage signal;

current signal connector means for interconnecting said controlled current source and the current sensing inputs of a power meter whereby said current sensing inputs receive said current signal;



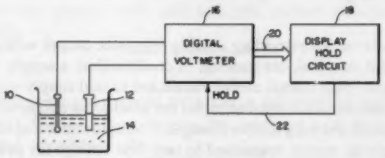
and voltage signal connector means for interconnecting said controlled voltage source and the voltage sensing inputs of said power meter whereby said voltage sensing inputs receive said voltage signal.

4,158,809

SIGNAL MEASURING AND DISPLAY CONTROL METHOD AND APPARATUS

Harry A. Dellamano, Thousand Oaks, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 28, 1977, Ser. No. 772,628
Int. Cl.[2] G01R *17/06*; H03K *5/20*; G01R *19/16*
U.S. Cl. 324—99 D **10 Claims**



1. A method of measuring a parameter of interest using sensing means for monitoring said parameter and generating an electrical analog signal the amplitude of which approaches, over a period of time, a stabilized value indicative of said parameter, said method providing a measure of said parameter prior to stabilization of said analog signal and comprising the steps of:

measuring the amplitude of said analog signal at a plurality of successive, predetermined time intervals prior to stabilization thereof;

generating respective digital pulse count signals corresponding to the measured amplitude values of said analog signal;

subtracting successive ones of said digital pulse count signals to derive a pulse count difference between said successive digital pulse count signals;

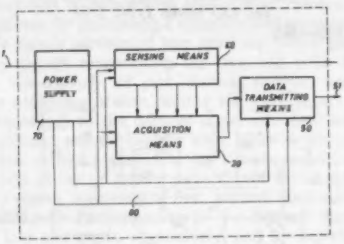
comparing said pulse count difference to a predetermined pulse count value; and

outputting as said measure of said parameter the amplitude value of said analog signal corresponding to a measurement for which said pulse count difference attains said predetermined value.

4,158,810
TELEMETERING POST FOR MEASURING VARIABLES IN A HIGH-VOLTAGE OVERHEAD LINE

Silvin M. Leskovar, Trzaska 51, Ljubljana, Yugoslavia (61000)

Continuation-in-part of Ser. No. 624,782, Oct. 20, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,597
Claims priority, application Yugoslavia, Oct. 21, 1974, 2811/74
Int. Cl.[2] G01R *1/20*; G08C *15/06*
U.S. Cl. 324—127 7 Claims



1. A telemetering post for a high-voltage overhead line, positioned on the power line conductor and supplied with the energy from same line, comprising:

sensing means juxtaposed with said conductor for monitoring at least one variable associated therewith and for producing output signals therefrom;

acquisition means connected to receive said output signals from said sensing means for measuring and real time data acquisition and for producing acquired data output signals;

transmitting means connected to receive said acquired data output signals for sending out acquired data;

circuit means for feeding operating energy from said power line conductor to said sensing means, said acquisition means, and said transmitting means; and

said acquisition means including

(a) at least one analog-to-digital converter of the type having an internal buffer register and sample-hold circuitry,

(b) multiplexer means, connected on the input side to said output signals from said sensing means and on the output side to said analog-to-digital converter;

(c) control circuitry for controlling said multiplexer means and said analog-to-digital converter, and

(d) buffer-to-output digital circuitry connected to said analog-to-digital converter;

whereby said multiplexer means is controlled to select from the input signals thereto one signal in one increment of time in the order determined by said control circuitry and said analog-to-digital converter is controlled to convert said selected signal into a digital value which is entered in said register of said analog-to-digital converter and is fed to said buffer-to-output circuitry and thence to said transmitting means.

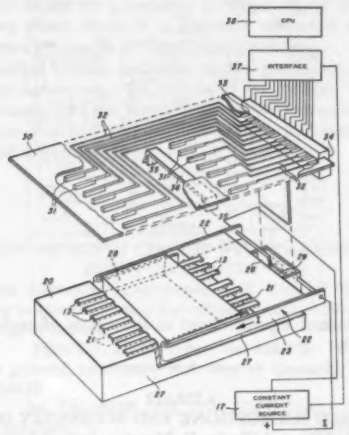
4,158,811
METHOD AND APPARATUS FOR TESTING AND SETTING MAGNETIC FIELD STRENGTH OF PERMANENT MAGNETS IN MAGNETIC BUBBLE DOMAIN MODULES

Hsiao-Yuan Li, Dallas; Rex A. Naden, Richardson; Alvis D. Stephenson, Jr., and Gene D. Lee, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 27, 1977, Ser. No. 810,148
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—210 15 Claims

1. Apparatus for establishing the magnetic bias field strength within an optimum range of the permanent magnet structure for a shielded magnetic bubble domain module having a pair of elongated slots extending through the module on opposite sides thereof, said apparatus comprising:

magnetic field generating means operably associated with said magnetic bubble domain module but separate therefrom and including conducting members adapted to be temporarily moveably inserted within the magnetic bubble domain module through the slots therein and oriented with respect thereto to vary the magnetic bias field of the magnetic bubble domain module;



current source means electrically connected to said magnetic field generating means for selectively providing a constant electrical current at any one of a plurality of magnitudes of constant currents to the conducting members of said magnetic field generating means; and

said magnetic field generating means providing a magnetic bias field within the magnetic bubble domain module at a selected field strength in response to energization of said conducting members thereof by a constant electrical current of a selected magnitude from said current source means.

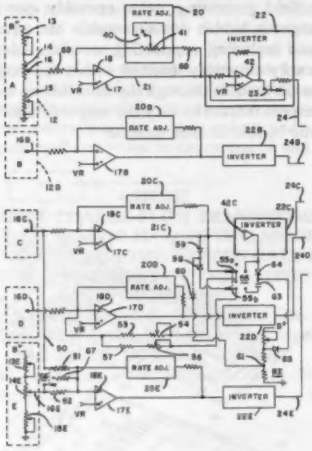
4,158,812
RADIO TRANSMITTER WITH INTERMIXED CONTROLS

Robert R. Hellman, Bridgeport, and Douglas M. French, Clinton, both of Conn., assignors to Westport International, Milford, Conn.

Filed May 5, 1978, Ser. No. 903,442
Int. Cl.[2] H04B *1/034*
U.S. Cl. 325—37 12 Claims

1. A radio transmitter for providing broadcast control signals to a remote model craft that are related to the setting of manual controls with there being one manual control for each control signal comprising a first manual control means for producing a first electrical command having a value related to its setting, a second manual control means for producing a second electrical command having a value related to its setting and a third manual control means for producing a third electrical command having a value related to its setting, means interconnecting the first control means and the second control means for altering the value of the second command in accordance with changes in the value of the first command, means interconnecting the first control means and the third control

means for altering the value of the third command in accordance with changes in the first command and means for broadcasting control signals related to the values of each of the commands.

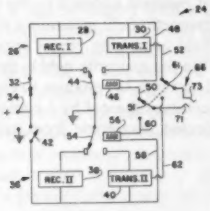


4,158,813

COMBINED MICROPHONE AND ACCESSORY DEVICE

Robert W. Ellis, and Charles D. Manaton, both of Tampa, Fla., assignors to Tampa Air Electronics, Tampa, Fla.

Filed Jul. 11, 1977, Ser. No. 814,215
Int. Cl.[2] H04B *1/04*
U.S. Cl. 325—102 **12 Claims**



1. An accessory device mounted to a microphone for operation from the power of a transmitter radio means having a microphone audio circuit and a transmitter activating circuit; the transmitter activating circuit having a first and a second terminal with a potential established therebetween for activating the transmitter radio means upon conduction of a first current level between the first and second terminals comprising, in combination:

a microphone housing;

a microphone mounted in said housing and adapted for connection to the microphone audio circuit of the transmitter radio means;

a microphone key switch mounted to said microphone housing and adapted for connection to the transmitter activating circuit for conducting the first current level between the first and second terminals upon closing said microphone key switch to activate the transmitter radio means;

an accessory device mounted to said microphone housing including a rechargeable battery means;

accessory switch means interconnecting said rechargeable battery and said accessory device for enabling flow of current therebetween to activate said accessory device upon closing said accessory switch means; and

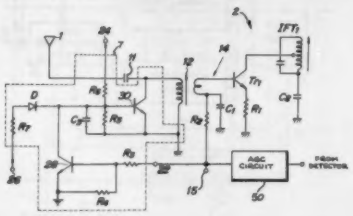
recharging circuit means including current limiting means connecting said first and second terminals to said rechargeable battery for charging said rechargeable battery at a second current level which is less than the first current level required to activate the transmitter radio means.

4,158,814

AUTOMATIC OVERLOAD PROTECTION SYSTEM

Kazuyoshi Imazeki, and Koichi Kazami, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Filed Sep. 8, 1977, Ser. No. 831,420
Int. Cl.[2] H04B *1/10, 1/18*
U.S. Cl. 325—362 **2 Claims**



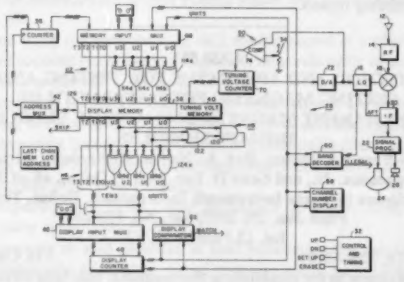
1. A system for automatically protecting the input circuitry of an electronic radio receiver from damage or malfunction caused by the application to said receiver of an input signal having a magnitude so large as to possibly damage said input circuitry, said system comprising: means, including an AGC circuit for generating an AGC signal and a phase-inverting circuit coupled to said AGC circuit for inverting the phase of said AGC signal, said means being responsive to the magnitude of a receiver produced signal indicative of input signal level for developing said AGC signal and a control signal comprising said phase-inverted AGC signal; variable impedance means, including a transistor having its emitter-collector junction coupled to and in parallel with said input circuitry and having its base coupled to said control signal, said variable impedance means responsive to said control signal for varying the impedance thereof in accordance with the magnitude of said receiver produced signal, whereby the variable impedance means harmlessly dissipates the energy resulting from excessively strong input signals before such signals can damage the input circuitry.

4,158,815

SYSTEM FOR REDUCING THE NUMBER OF BINARY SIGNALS REPRESENTING CHANNEL NUMBERS

Charles M. Wine, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,919
Int. Cl.[2] H04B *1/06*
U.S. Cl. 325—455 **9 Claims**



1. In a tuning system, apparatus comprising:

first means for processing a first coded arrangement of binary signals partitioned into first and second groups of binary signals representing the tens and units decimal digits, respectively, of a channel number, each of said first and second groups consisting of first, second, third and fourth binary signals corresponding to the decimal digits one, two, four and eight, each of said binary signals having one of a first state indicating the presence of the corresponding decimal digit in determining said channel number or a second state which is the complement of said first state and indicating the absence of the corresponding decimal digit in determining said channel number; and

second means for processing a second coded arrangement of binary signals partitioned into third and fourth groups of binary signals representing the tens and units decimal digit, respectively, of said channel number, said third group consisting of first, second and third binary signals corresponding to the decimal digits one, two and four, respectively, and having the same states as the states of said first, second and third binary signals, respectively, of said first group of binary signals, said fourth group of binary signals consisting of first, second, third and fourth binary signals corresponding to the decimal digits one, two, four and eight, respectively, and having the same states as the states of said first, second, third and fourth binary signals, respectively, of said second group when the tens decimal digit of said channel number is less than eight and otherwise having states which are the complements of the states of said first, second, third and fourth binary signals, respectively, of said second group; and

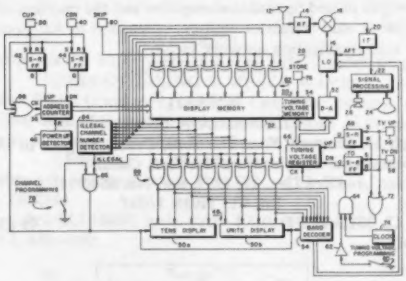
code conversion means for converting one of said first and second coded arrangements of binary signals to the other of said first and second coded arrangements of binary signals.

4,158,816

MEMORY TYPE TUNING SYSTEM WITH PROVISIONS FOR SKIPPING NONPREFERRED TUNING POSITIONS

Charles M. Wine, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,918
Int. Cl.² H04B *1/26*
U.S. Cl. 325—464 **4 Claims**



1. A tuning system for tuning a receiver to receive radio frequency carriers associated with various tuning positions in a predetermined range of tuning positions available for selection by a user, comprising:

memory means including a plurality of memory locations for storing binary words consisting of respective groups of binary signals, display binary words consisting of groups of binary signals arranged in coded formats to represent respective ones of said tuning positions being normally stored in said memory locations, each of said memory locations being identified by an address;

tuning position selection means for generating address signals representing the address of the memory location associated with a presently selected tuning position;

tuning position display means for displaying symbols representing said tuning positions in response to the display binary word stored in a presently addressed memory location;

input means for selectively complementing each of the binary signals included in the binary word stored in a presently addressed memory location to form a resulting binary word, resulting binary words formed by complementing all the binary signals included in a display binary word representing illegal tuning positions not in said predetermined range; and

detector means for generating an illegal signal when the binary word stored in a presently addressed memory location represents an illegal tuning position;

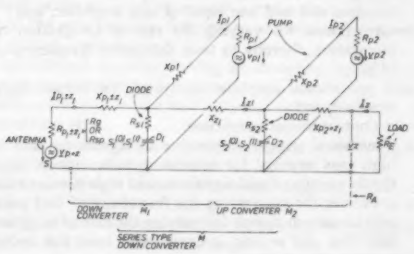
said tuning position selection means generating address signal representing the address of the memory location associated with the tuning position next in succession to said presently selected tuning position in response to said illegal signal.

4,158,817

MICROWAVE INPUT CIRCUIT WITH PARAMETRIC DOWN CONVERTER

Karl-Heinz Löcherer, Langenhagen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Jul. 22, 1977, Ser. No. 818,326
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633421
Int. Cl.² H04B *1/16, 1/26;* H03F *7/00*
U.S. Cl. 325—485 **20 Claims**



1. In a microwave input circuit including a parametric upper sideband down converter for receiving an input signal whose frequency is not much different from the intermediate frequency (f_2) produced at the output of said down converter, said converter having its signal input directly connected to a microwave antenna and terminated by a real impedance at the input signal frequency; the improvement wherein: said parametric down converter is of the series type; said signal input is terminated with the real antenna resistance (R_g) at the input signal frequency (f_{s1}); said down converter comprises a cascade connection of first and second parametric converter stages with said first converter stage (M_1) being a series type down converter including a first reactance diode and a first pump circuit, and with said second converter stage (M_2) being a series type up converter including a second reactance diode and a second pump circuit; said down converter stage is terminated at its image frequency (f_{sp}) with a real resistance (R_{sp}) and the following relationship is satisfied:

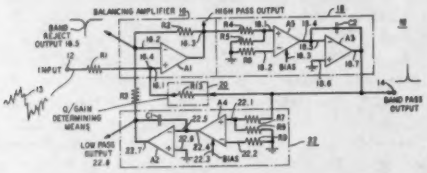
$$\frac{f_{s1}}{f_{sp}} \cdot \frac{R_g + R_{s1}}{R_{sp} + R_{s1}} \approx 1$$

where R_{s1} is the series resistance of said first reactance diode in said first converter stage.

4,158,818
SIGNAL PROCESSORS UTILIZING TUNEABLE BANDPASS FILTERS AND TRIGGER CIRCUITS

Daniel M. Lerner, Highland Park, N.J., assignor to Neptune Eastech, Inc., Edison, N.J.

Filed Apr. 11, 1977, Ser. No. 786,251
Int. Cl.[2] H04B 15/00
U.S. Cl. 328—167 22 Claims

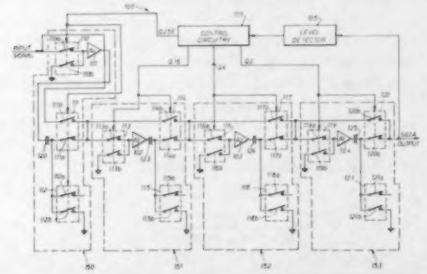


1. A tuneable bandpass filter comprising
an input and an output terminal,
a first circuit path connected between said terminals,
said first path including a differential operational amplifier which has a pair of differential inputs and which rejects signals outside the bandpass of said filter and a first variable rate integrator connected in series with one another, said input terminal being coupled to one differential input of said amplifier and said output terminal being coupled to the output of said integrator and providing a bandpass output,
a second circuit path including a second variable rate integrator having its input coupled to said output terminal and its output coupled to said other differential input of said amplifier,
Q and gain determining means coupled between said output terminal and said one input of said amplifier, and
control means for varying the rate of integration of said integrators, thereby to tune the center frequency of said filter,
said operational amplifier comprises an output high pass terminal, and
said control means comprises
a transitional trigger responsive to signals on said output high pass terminal for generating pulse signals related to the frequency of said signals on said high pass terminal and
a converter for converting the frequency of said pulse signals to current signals for varying the rate of integration of said first and second integrators to tune the center frequency of said filter.

4,158,819
INSTANTANEOUS FLOATING POINT AMPLIFIER

Miles A. Smither, Houston, Tex., assignor to Geosource Inc., Houston, Tex.

Continuation of Ser. No. 749,218, Dec. 10, 1976, Pat. No. 4,014,596. This application Jul. 3, 1978, Ser. No. 921,599
Int. Cl.[2] H03G 3/20
U.S. Cl. 330—9 8 Claims

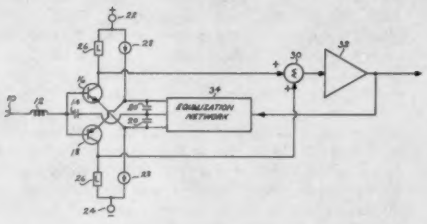


1. In an instantaneous floating point amplifier which amplifies the source signal to a level within preselected limits, said amplifier including n amplifier stages, and each of said amplifier stages having a gain, the improvement comprising:
circuitry for producing 2^n combinations of gains from the n amplifier stages for application to the source signal by enabling those stages required to amplify said source signal and by bypassing those stages not required to amplify said source signal.

4,158,820
LOW LEVEL PREAMPLIFIER CIRCUIT

Gerald R. Stanley, Mishawaka, Ind., assignor to Crown International, Inc., Elkhart, Ind.

Filed Feb. 1, 1978, Ser. No. 874,040
Int. Cl.[2] H03F 1/26, 3/183
U.S. Cl. 330—149 3 Claims

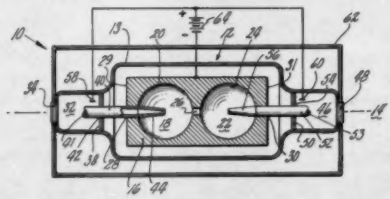


1. A low level preamplifier circuit for an audio input comprising an NPN bipolar transistor, a PNP bipolar transistor, an operational amplifier, the bases of said transistors connected in AC common for receiving the audio input, the emitters of said transistors connected in an AC common, means for similarly biasing said transistor emitters, the collectors of said transistors being connected in a summing mode to the input terminal of said operational amplifier, whereby RFI input into said transistor bases generates complementary cancelling distortion in said transistor collectors, and an equalization network means for controlling frequency response and gain by use of negative feedback, said equalization network means connected between the output of said operational amplifier and the emitters of said transistors, said transistor emitters connected in AC common with said equalization network means.

4,158,821
LASER GAIN TUBE

Joseph M. Bresman, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1977, Ser. No. 864,951
Int. Cl.[2] H01S 3/097
U.S. Cl. 331—94.5 D 19 Claims



1. An improved laser gain tube comprising:
a housing having a longitudinal axis;
a cathode disposed within the housing;
a first chamber located within the cathode
having a first entrance extending from one end of the cathode to the first chamber;

a second chamber located within the cathode having a second entrance extending from the other end of the cathode to the second chamber wherein the first and second chambers are interconnected through an aperture positioned therebetween;

a first tube having a bore centrally located therein disposed about the longitudinal axis extending through the first entrance into the first chamber;

a second tube having a bore centrally located therein disposed about the longitudinal axis extending through the second entrance into the second chamber;

means for ionizing a gas within the housing to provide a laser gain medium; and

means for passing electromagnetic radiation through the housing.

4,158,822

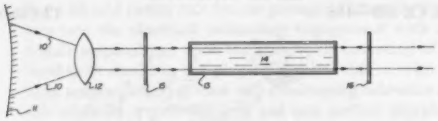
PHOSPHORESCENCE EXHIBITING MATERIALS FOR OPTICALLY PUMPED LASERS

Jeffrey K. S. Wan, Kingston, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jul. 20, 1978, Ser. No. 926,308

Int. Cl.[2] H01S 3/20; C07F 7/08; C09K 11/06

U.S. Cl. 331—94.5 L **30 Claims**



1. A phosphorescent composition comprising the reaction product of an organic substituted silane and a quinone.

24. An optically pumped laser comprising:

resonant cavity means;

a phosphorescent liquid material contained within the resonant cavity means; said material being the reaction product of an organic substituted silane and a quinone in a solvent; and

means for directing optical energy onto the phosphorescent material to excite the material sufficiently to sustain laser action.

4,158,823

TRANSDUCER ELECTRODES FOR FILTER OR DELAY LINES UTILIZING SURFACE WAVES

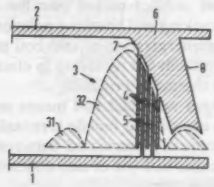
Wilhelm Kuny, Gruenwald, and Karl Langecker, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 1, 1977, Ser. No. 783,836

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1976, 2618144

Int. Cl.[2] H03H 9/04, 9/26, 9/30; H01L 41/10

U.S. Cl. 333—151 **8 Claims**



4. A device comprising a substrate with a major surface,

first and second substantially parallel metallized electrodes formed on said major surface of said substrate extending in a longitudinal direction,

a first plurality of metallized fingers of different lengths extending from said first electrode in a direction normal to said first electrode,

a generally tapered metallized conductive area extending from said second electrode with front and rear edges relative to a surface wave being at an angle other than zero degrees to said second electrode, and

a second plurality of metallized fingers of different lengths extending from the front edge of said metallized conductive area normal to said second electrode and ones of said first and second plurality of fingers alternately spaced on said substrate.

4,158,824

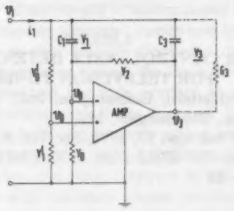
MULTI-NODE IMMITTANCE NETWORK

Joannes C. A. M. Wouters, Schoten, and Hugo F. J. Witters, Berlaar, both of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 1, 1977, Ser. No. 830,007

Int. Cl.[2] H03H 11/00

U.S. Cl. 333—213 **9 Claims**



1. A multi-node immittance network producing between two input nodes an immittance with a real component proportional to the square of the frequency, one of said input nodes being ground, comprising:

an operational amplifier having an inverting input, a non-inverting input and an output;

a first admittance connected between said output and said inverting input;

a second admittance connected directly between said output and the other of said input nodes;

a third admittance connected between said non-inverting input and said other of said input nodes; and

a fourth admittance connected between said inverting input and said other of said input nodes.

4,158,825

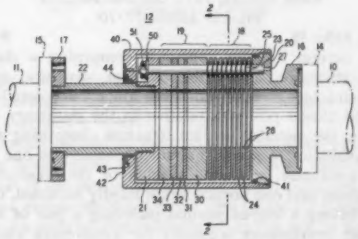
WAVEGUIDE EXPANSION JOINT

Robert P. Guenther, Middletown, N.J., and Melvin S. Zucker, deceased, late of Long Island City, N.Y. (by Ethel Zucker, administratrix), assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1977, Ser. No. 865,509

Int. Cl.[2] H01P 1/06, 5/02, 3/13

U.S. Cl. 333—257 **6 Claims**



1. An expansion joint which comprises:

a first termination member adapted for connecting the expansion joint to a first transmission member;

a second termination member movably mounted in prescribed spatial relationship to said first termination member and being adapted for connecting the expansion joint to a second transmission member;

a plurality of elongated support members rigidly affixed to and in prescribed relationship with said first termination member;

a plurality of first spacer members each having a center aperture for wave propagation and being movably supported on said support members in prescribed spatial relationship with said first termination member; and

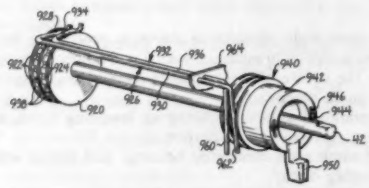
a plurality of resilient members movably mounted on said support members between individual ones of said first spacer members, a resilient member being disposed on each support member in contact with an individual spacer member and an adjacent member thereby allowing for changes in the spatial separation between said spacer members to compensate for expansion and contraction of said transmission members.

4,158,826

OPERATOR CONTROLLABLE DETENT MECHANISM FOR TELEVISION TUNERS

Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed Apr. 17, 1978, Ser. No. 896,638
Int. Cl.[2] H03J *1/00, 5/00;* **F16H** *35/18*
U.S. Cl. 334—88 **20 Claims**



1. A television tuner arrangement, comprising a station selector shaft, detenting means for exerting a restraining force on said shaft so that it is detented in a plurality of equally spaced detent positions as said selector shaft is rotated, means for receiving different television stations when said selector shaft is in different ones of said equally spaced detent positions, and manually operable means for disabling said detenting means.

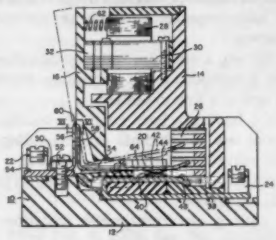
4,158,827

CURRENT LIMITING CONTACTOR

Walter V. Bratkowski, McKeesport, and Kurt A. Grunert, Beaver, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 21, 1977, Ser. No. 808,573
Int. Cl.[2] H01H *77/10*
U.S. Cl. 335—16 **9 Claims**

1. A current limiting contactor comprising a stationary contact structure, a movable contact structure, movable contact structure means for moving contact structure between open and closed positions relative to the stationary contact structure, the movable contact structure comprising an elongated conductor, a movable contact mounted on one portion of the conductor, a second portion of the conductor and spaced from said one portion being fixedly mounted, the conductor having a looped portion including a pair of integral, unhinged overlapping segments for conducting current in opposite directions of each other, the movable contact being in contact with the stationary contact structure when conducting a current up to a predetermined value, and the conductor being comprised of a flexible material and the overlapping segments being separable to move the movable contact away from the



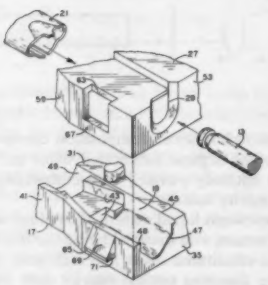
stationary contact structure when the current exceeds said predetermined value.

4,158,828

RELAY DEVICE

Thomas J. Kindelspire, Morris, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed May 11, 1977, Ser. No. 795,797
Int. Cl.[2] H01H *9/02*
U.S. Cl. 335—156 **17 Claims**



1. A relay device adapted to be removably mounted in plug-on circuit relation with a pair of male terminals of an electrically energized apparatus, the relay device comprising:

a housing having receptacle means adapted for the releasable mounting in the plug-on circuit relation with the male terminals;

coil means arranged with said housing and adapted for electrical energization;

switch means in said housing including a first pair of contact means, a second pair of contact means movable between making and breaking positions with respect to said first contact means pair, and armature means disposed in magnetic coupling relation with said coil means and associated with said second contact means pair for moving them from one of the making and breaking positions to the other thereof upon the energization of said coil means;

a pair of female terminals for receiving in electrical contacting engagement the male terminals;

a first lead associated with said coil means and electrically connected with one of said female terminals;

a second lead electrically connected between the other of said female terminals and one of said contact means of said first contact means pair;

said receptacle means including a first portion having a pair of opposite surfaces interconnected between a plurality of side surfaces, a pair of cavities in said first portion intersecting with one of said opposite surfaces and one of said side surfaces of said side surface plurality and in which said female terminal pairs are predeterminately positioned in seating engagement, respectively, a pair of passage

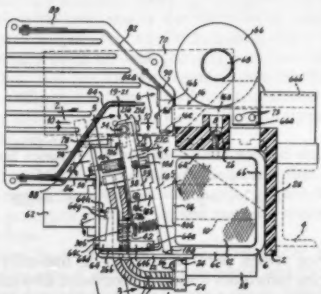
means in said first portion and associated with said cavity pair for receiving a part of said first and second leads, respectively, said passage means pairs respectively intersecting with another of said side surfaces of said side surface plurality and at least one of said one opposite surfaces and the other of said opposite surfaces, said receptacle means also including a cover portion arranged in a predetermined assembled position on said first portion and having a plurality of wall means including a cover wall interconnected between a plurality of sidewalls depending therefrom, said cover wall being disposed generally in overlaying relation with said one opposite surface and at least some of said sidewalls of said sidewall plurality being disposed at least in part in opposed confronting relation with at least some of said side surfaces of said side surface plurality so as to generally capture said female terminal pair in said cavity pair with said at least part of said first and second leads enclosed within said passage means pair when said cover portion is in its predetermined assembled position on said first portion, means on at least said cover wall for abutting engagement with said female terminal pair to at least limit displacement movement of said female terminal pair from the seating engagement thereof in said cavity pair, respectively, a pair of openings in said one sidewall of said sidewall plurality communicating with said cavity pair for the passage of the male terminals into the electrical contacting engagement with said female terminal pair upon the removable mounting of the receptacle means in the plug-on circuit relation with the male terminals, and at least two confronting sidewalls and side surfaces of said sidewall and side surface pluralities respectively including integral means cooperatively associated for releasably maintaining said cover portion against displacement from its predetermined assembled portion on said first portion.

4,158,829

ELECTROMAGNETICALLY OPERATED DC POWER CONTACTOR

Robert C. Gutberlet, Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Sep. 1, 1977, Ser. No. 829,809
Int. Cl.[2] H01H *9/30*
U.S. Cl. 335—201 **13 Claims**



1. A high current switch comprising:

a stationary contact comprising an arcing contact and a main contact having their contact faces at an angle of approximately 270 degrees with respect to one another;

a movable-contact actuator pivotally supported with respect to said stationary contact for movement in a clockwise, contact-closing direction;

a spring-biased movable-contact carrying lever means pivotally supported on said actuator for movement in a counterclockwise direction with respect to said actuator against the force of its bias spring;

a spring-biased movable contact pivotally supported on said lever means for movement in a clockwise direction with respect to said lever means against the force of its bias spring and comprising an arcing contact and a main contact having their contact faces at approximately a right angle with respect to one another;

and means fixing the initial state of said movable contact on said lever means so that upon initial pivotal movement of said actuator in said clockwise, contact-closing direction, said movable arcing contact engages said stationary arcing contact to close the switch;

and additional pivotal movement of said actuator in said clockwise, contact-closing direction causes said lever means to pivot in said counter-clockwise direction with respect to said actuator against the force of its bias spring thereby causing said movable arcing contact to slide and rock on said stationary arcing contact until said movable main contact closes against said stationary main contact;

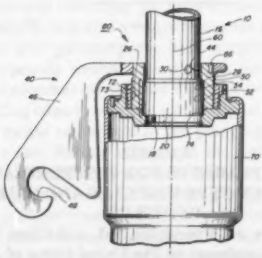
and further pivotal movement of said actuator in said clockwise, contact-closing direction causes said lever means to pivot further in said counter-clockwise direction with respect to said actuator against the force of its bias spring and also causes said movable contact to pivot in said clockwise direction against the force of its bias spring thereby causing both said movable arcing contact and said movable main contact to rock and slide on the respective stationary arcing and main contacts to afford increased contact force with minimum torque requirement on said actuator to maintain the contacts effectively closed thereby resisting contact opening under fault conditions.

4,158,830

FITTING FOR A CIRCUIT-INTERRUPTING DEVICE

Bruce A. Biller, Chicago, and Henry W. Scherer, Mt. Prospect, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Sep. 27, 1977, Ser. No. 837,241
Int. Cl.[2] H01H *71/20*
U.S. Cl. 337—171 **16 Claims**



1. Apparatus for mounting a fitting to a circuit-interrupting device having a central axis, the device being selectively placeable in a mounting therefor, comprising

first means carried by the fitting for engaging a portion of the device about the axis thereof to limit relative movement of the device and the first means along the axis;

second means attachable to the first means for clamping the device portion therebetween along the axis to mount the fitting to the device; and

third means carried by the fitting for selectively engaging and disengaging the device mounting.

4,158,831
SINGLE TURN POTENTIOMETER WITH HELICAL COIL SPRING WIPER

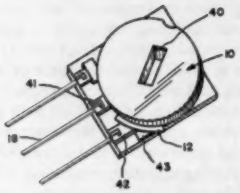
Randall C. Ragan, Rancho Santa Fe, Calif., assignor to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 642,328, Dec. 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 452,130, Mar. 18, 1974, Pat. No. 3,964,011. This application May 20, 1977, Ser. No. 798,990

The portion of the term of this patent subsequent to Oct. 17, 1995, has been disclaimed.

Int. Cl.[2] H01C *10/34*

U.S. Cl. 338—174 8 Claims



1. A variable resistance device comprising:
a substrate including a collector and resistance element;
terminal means on said substrate for connection to at least one end of the resistance element and the collector;
a contactor having drive means attached thereto for moving said contactor along said substrate, said contactor including a recess therein facing said resistance element;
a helical coil spring wiper in said recess and engaging said resistance element and said collector ring for making electrical contact therebetween;
a cylindrically shaped resilient support located in said recess and pressed against an arcuate portion of said wiper for constraining said wiper from axial rotation as said contactor is moved; and
means for movably securing said contactor to said substrate.

4,158,832
SEISMIC APPARATUS FOR DISCRIMINATION BETWEEN TRACK-TYPE VEHICLES AND WHEEL-TYPE VEHICLES

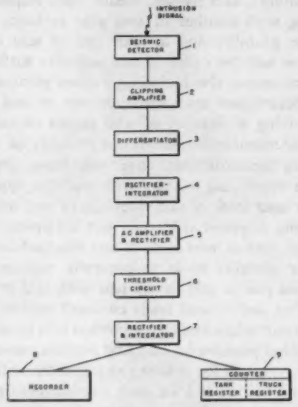
Roswell P. Barnes, Jr., Providence, R.I., and Glenn E. Fellows, Weston, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 19, 1961, Ser. No. 118,205

Int. Cl.[2] G08G *1/00*

U.S. Cl. 340—38 S 13 Claims

10. A vehicle identifying circuit comprising: means for detecting seismic vibrations created by passing vehicles and converting them into electrical impulses; frequency-sensing circuit means coupled to said detecting means for producing electrical signals in accordance with the frequency characteristics of said impulses, said frequency-sensing circuit means comprising an amplifier, a clipper circuit, a differentiator circuit, a rectifier and an integrator coupled in sequence to produce said electrical signals; and vehicle discriminating circuit means coupled to said frequency-sensing means to convert said



signals into output pulses having voltage levels indicative of the character of the suspension system of the passing vehicle.

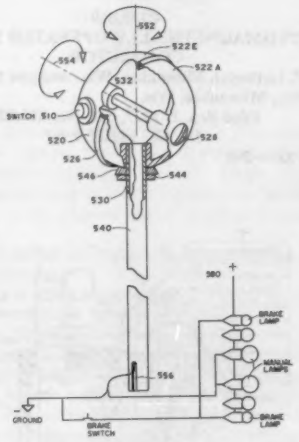
4,158,833
MANUAL DOWNSHIFT DEACCELERATION WARNING LIGHT SYSTEM

Gustave J. Chicoine, 1052 Cumberland Pl., San Jose, Calif. 95125

Division of Ser. No. 659,223, Feb. 19, 1976. This application Jan. 24, 1977, Ser. No. 762,162

Int. Cl.[2] B60Q *1/26*; H01H *3/16*

U.S. Cl. 340—72 10 Claims



1. A device which permits a driver to manually activate vehice braking indicators during transmission downshift deacceleration while repositioning a transmission shift lever via a shift knob releasably mounted on a threaded end portion of the transmission shift lever, comprising:
a spherical shift knob formed by an upper hemisphere and a lower hemisphere;
a manually operated switch mounted on the surface of the upper hemisphere for activating the braking indicators;
threaded means adapted to releasably engage the threaded end portion of the transmission shift lever for releasably securing the lower hemisphere to the transmission shift lever;

the lower hemisphere adapted to be releasably mounted on the shift lever for permitting the shift knob to be rotated when released about a first axis extending through the threaded end portion;

the upper hemisphere releasably engaging the lower hemisphere along a plane of engagement which is generally inclined with respect to the first axis permitting the upper hemisphere to be rotated when released about a second axis orthoganal to the plane of engagement and generally inclined with respect to the first axis; and

securing means extending between the two hemisphere for releaseably engaging the upper hemisphere to the lower hemisphere;

whereby the manual switch may be respositioned with respect to the driver anywhere within an area on the sphere defined by rotating the shift knob about the first axis and rotating the upper hemisphere about the second axis.

4,158,834

DATA BUFFER FOR A LABEL READER SYSTEM INCLUDING A DATA PROCESSOR

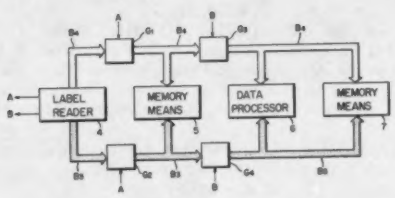
Sadao Nakanishi; Kazuhiro Suzuki; Nobufumi Tokura, and Shinichiro Endo, all of Ise, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,011

Claims priority, application Japan, Apr. 6, 1977, 52-39751

Int. Cl.[2] G06K 9/00

U.S. Cl. 340—146.3 MA **2 Claims**



1. A data buffer for a label reader system including a data processor and at least one label reader comprising:

a data buss connected to the data output of a label reader and to the data processor;

a first memory means connected to said data buss at a point along said data buss between the label reading unit and the data processor;

said data buss including therein a first gate means at a point between the label reader and the point at which said first memory is connected to said data buss, and a second gate means at a point between the data processor and the point at which said first memory means is connected to said data buss, the gating actions of said first and second gate means being adapted to be controlled by control signals provided by the label reader;

a second memory means connected to said data buss at a point such that the gating actions of said first and second gate means cannot affect the transfer of data between the data processor and said second memory means over said data buss;

an address buss connected to the label reader, to said first memory means, to the data processor, and to said second memory means; said first memory means being connected to said address buss at a point along said address buss between the label reader and the data processor;

a third gate means connected in said address buss at a point between the label reader and the point at which said first memory means is connected to said address buss;

a fourth gate means connected in said address buss at a point between the data processor and the point at which said first memory means is connected to said address buss;

wherein the gating actions of said third and fourth gate means are adapted to be controlled by said control signals; and wherein if said control signals cause said first gate means to permit the flow of data signals therethrough, then said second gate means blocks are flow of data signals therethrough; and if said control signals cause said first gate means to block the flow of data signals therethrough, then said second gate means permits the flow of data signals therethrough.

4,158,835

ARRANGEMENT FOR DETECTING A WINDOW AREA OF A WINDOW-HAVING MAIL ITEM

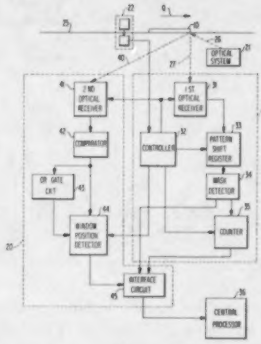
Tetsuo Miura, and Yasuo Nishijima, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1977, Ser. No. 851,655

Claims priority, application Japan, Nov. 16, 1976, 51-138184

Int. Cl.[2] G06K 9/04

U.S. Cl. 340—146.3 H **4 Claims**



1. An arrangement for use together with a device for detecting those information positions of mail items where postal information pieces are described, respectively, said mail items being successively fed along a predetermined path of a predetermined direction at a substantially predetermined speed, having leading edges, respectively, and including a mail item having a window area and a remaining area, the information positions of the window-having mail item being located at least inside said window area, said device comprising optical means for illuminating by light the successively fed mail items along a line predetermined relative to said path to intersect said path, said window area reflecting the light irregularly and approximately regularly, said remaining area and the mail items having no window area reflecting the light irregularly, said device further comprising means responsive to the leading edge of each of said successively fed mail items for determining a point on said leading edge to produce a point signal indicative of said point, and means responsive to the point signals produced in response to said leading edges and the light irregularly reflected from said successively fed mail items for detecting the information positions of said successively fed mail items relative to the predetermined points and said predetermined direction to produce information position signals indicative of the detected information positions, said arrangement comprising:

first means to be coupled to said optical means and said point determining means and responsive to the light approximately regularly reflected from said window area for producing a window position signal indicative of a window position of said window area relative to the predetermined point on the leading edge of said window-having mail item and said predetermined direction; and

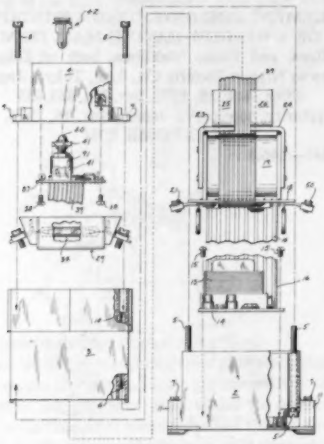
second means to be coupled to said information position detecting means and responsive to said window position signal and said information position signals for selecting the information position signals indicative of the information positions located inside said window area.

4,158,836

SOLID STATE TIMER FOR SEALED CONTACT RELAY

Wayne H. Wielebski, Milwaukee, and Joseph D. Radtke, Cudahy, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Continuation of Ser. No. 685,700, May 12, 1976, abandoned. This application Apr. 27, 1978, Ser. No. 900,477
Int. Cl.[2] G08B 1/00
U.S. Cl. 340—309.1 7 Claims



1. In a sealed contact relay, the combination comprising:

a base section having a housing which encloses a power supply that includes a transformer;

an energizing and switch section having a housing which mounts to said base section housing and having a timed relay coil and associated magnetic circuit;

a sealed contact switch cartridge mounted to said energizing and switch section housing and magnetically coupled to said timed relay coil by said magnetic circuit for operation thereby; and

a timing section having a housing which mounts to said energizing and switch section housing on the side opposite said base section and which encloses a digital programmable timer that electrically connects through a flexible cable to said energizing and switch section to control said timed relay coil and which connects through said flexible cable to said base section to receive power therefrom.

4,158,837

INFORMATION DISPLAY APPARATUS

James T. Zahorsky, Saugerties, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

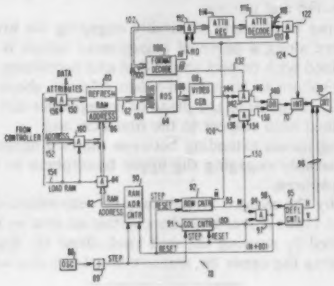
Filed May 17, 1977, Ser. No. 797,725
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—804 8 Claims

1. In display apparatus having a display medium and a stream of digital information in the form of data bytes coupled to said medium by means including one of plural decoder means to effect display of visually perceptible indicia at locations on said medium,

the method of decoding said data bytes comprising:

the step of detecting the locations within said medium at which said indicia are to be displayed,

and the further step of using said location as a control to direct a said byte to said one decoder means if said byte relates to a given position on said medium and in the alternative to a different one of said plural decoder means if said byte relates to a different position on said medium.



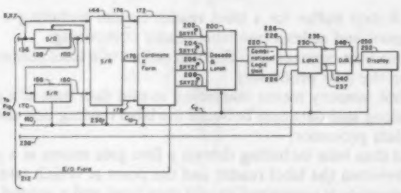
whereby the byte is used to cause display of corresponding visual data as determined by said one decoder means or not according to said position.

4,158,838

IN-RASTER SYMBOL SMOOTHING SYSTEM

Michael D. Pruznick, Huntington Beach, Calif.; Bruce W. Keller, Scotland, Ark.; James R. Phelps, Torrance, Calif.; Gerald Wolfson, Los Angeles, Calif., and James L. Heard, Torrance, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 674,781, Apr. 8, 1976. This application Jan. 16, 1978, Ser. No. 869,721
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—750 10 Claims



1. A display system for providing in a time sequence a display of elements along display lines on a display with each displayed element having a controlled intensity, comprising:

a source of binary display codes, each code representing positional information of a predetermined pattern of display elements, and each combination of codes representing a predetermined intensity distribution, said source of binary display codes having a memory cell for each four display elements with each memory cell storing a single display code comprised of three or more binary bits, each single display code contributing to the intensity value of at least four display elements; and

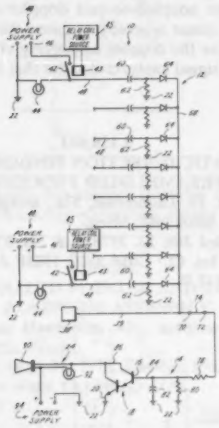
decoding means responsive to said source of binary display codes for generating decoded values representing one of three or more intensity values of said pattern of display elements in a time sequence corresponding to the time sequence of said display elements and including means for responding to the codes in a plurality of memory cells, with the codes from a predetermined number of memory cells contributing to the intensity of predetermined display elements.

4,158,839

TRANSITION ALARM CIRCUIT

Joseph M. Drobniak, Houston, Tex., assignor to Powell Magnetic Industries, Inc., Houston, Tex.

Filed Sep. 3, 1976, Ser. No. 720,495
Int. Cl.[2] G08B *25/00*
U.S. Cl. 340—524 **21 Claims**



1. A circuit for responding to bidirectional changes in state of an input signal at an input between a first state and a second state, the input being connected to a voltage potential through a switch, the first state of the input signal existing when the switch is open and the second state of the input signal existing when the switch is closed, the circuit comprising:

an output driver;

actuation means for actuating said output driver, said actuation means being responsive to a supply of current from such input; and

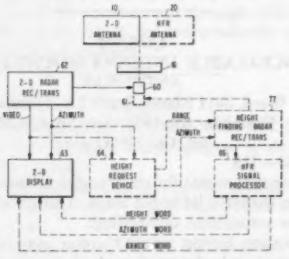
inhibiting means for inhibiting the supply of current from said input to said actuation means, said inhibiting means being responsive only to the state of the input signal being time invariant for at least a first period of time and to changes in the state of the input signal from said second state to said first state.

4,158,840

3-D RADAR COMPRISING 2-D RADAR WITH HEIGHT FINDING ATTACHMENT

Carl E. Schwab, Huntington Station, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Nov. 11, 1977, Ser. No. 850,528
Int. Cl.[2] G01S *7/20, 9/233*
U.S. Cl. 343—6 R **22 Claims**



1. A three-dimensional radar system comprising:

a two-dimensional radar system for locating objects in terms of azimuth and range from a reference location, including a first r-f receiver/transmitter and a rotatable antenna pointing in a direction, said direction sweeping 360° in azimuth as said antenna is rotated,

said two-dimensional radar system also including a first signal processing means responsive to signals emitted by said first receiver/transmitter for locating range and azimuth of an object by detecting energy reflected from said object,

a height finding antenna, mounted on said rotatable antenna, a second r-f receiver/transmitter coupled thereto, said height finding antenna pointing in a second direction, said second direction sweeping 360° in azimuth as said rotatable antenna is rotated, said second direction fixed relative to said first direction, and

a second signal processing means responsive to signals from said first processing means and said second receiver/transmitter for determining height of said object.

18. A matched filter radar processor for extracting target height from reflected signals produced by a linearly frequency modulated pulsed transmission from an elevation antenna of aperture θ/n, where θ is total scanned elevation, which minimizes equipment duplication by employing target range data comprising:

a frequency conversion means responsive to said reflected signals for down converting said signals in frequency,

processing means responsive to said down converted signals including a mixer and a compression filter for compressing outputs of said mixer,

a local oscillator connected to said mixer producing in time sequence a plurality of different frequencies,

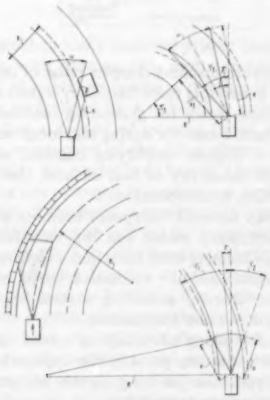
and trigger means to enable said local oscillator a predetermined time after transmission, said predetermined time varying in accordance with target range.

4,158,841

METHOD AND APPARATUS FOR THE CONTROL OF THE SAFETY DISTANCE OF A VEHICLE RELATIVE TO PRECEDING VEHICLES

Erwin Wüchner, Grossheppach; Ulrich Heitmeyer, Rosbach von der Höhe, and Walter Kostelezky, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 796,869
Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623643
Int. Cl.[2] G01S *9/46*
U.S. Cl. 343—7 VM **28 Claims**



1. A method for the control of the safety distance of a vehicle with respect to preceding objects, which vehicle is equipped with measuring means for measuring at least one of

distance and relative velocity, comprising the following steps (a) through (e):

(a) determining whether a detected object lies within a maximum interference-free measuring distance from the vehicle,

(b) changing at least the pivot angle of an antenna of a transmitter of the vehicle dependent on at least one of steering wheel deflection and transverse acceleration of the vehicle,

(c) determining extended objects which are to be suppressed by a separate measurement of the distance of the vehicle to the object and of the relative velocity between the vehicle and the object by comparing one of (i) measured distance change with a calculated distance change or (ii) measured relative velocity with a calculated relative velocity,

(d) preferring among all objects, an object recognized as "preceding vehicle", and

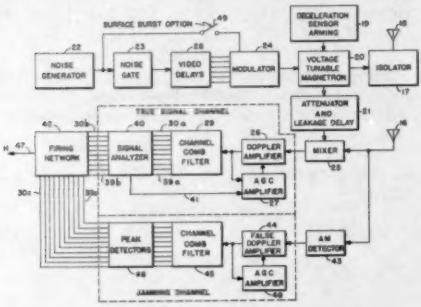
(e) combining in accordance with the maximum interference-free measuring distance values of at least one of the measured distance of the vehicle to the object, the measured relative velocity between the vehicle and the object and the measured velocity of the vehicle to provide control magnitudes for enabling prevention of a collision of the vehicle with the object.

4,158,842

RADAR TYPE FUZES

John E. Clemens, Xenia, Ohio; Thomas C. Stephens; Albert E. Dilz, both of Richmond, Ind., and James A. Hewlett, Cincinnati, Ohio, assignors to Avco Corporation, Cincinnati, Ohio

Filed Mar. 31, 1965, Ser. No. 444,948
Int. Cl.[2] F42C *13/04*
U.S. Cl. 343—7 PF **15 Claims**



1. In a target-approaching doppler radar of the type including means for generating radio frequency signals and supplying local oscillations, means for generating random noise bursts, modulator means, means for mixing said local oscillations with echo signals, a doppler amplifying channel, and means for controlling the sensitivity of said channel, the improvement which comprises, in combination:

a video delay network interposed between the noise burst signal generating means and the modulator means for effectively forming each burst into a sequence of bursts of like character and the successive bursts into successive sequences, thereby providing several opportunities for correlation at radio frequencies;

and means for taking advantage of a later opportunity for correlation if at any point in the approach to the target barrage-type false jamming signals are prsent, the last-mentioned means comprising:

filter means in the doppler signal amplifying channel for dividing the doppler signal spectrum down into a plurality of segments large in number with respect to the number of adjacent segments into which a true doppler signal falls;

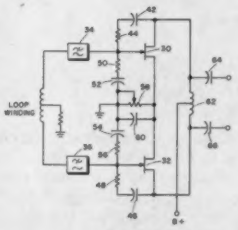
and signal analyzer means having a like plurality of inputs coupled to said filter means, said signal analyzer means being formed to determine whether signals applied to it are true doppler signals falling within said small number of segments or barrage-type false jamming signals spanning a larger number, and said signal analyzer including an output coupled to said doppler-channel sensitivity control means whereby to cause the control means to desensitize the doppler amplifying channel in the event that the signal analyzer decides that a jamming signal is present.

4,158,843

AUTOMATIC DIRECTION FINDER ANTENNA PREAMPLIFIER PROCESSOR

Ray W. Kuchy, Ft. Lauderdale, Fla., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 23, 1978, Ser. No. 871,311
Int. Cl.[2] G01S *3/00*; H03F *3/45*
U.S. Cl. 343—113 R **1 Claim**



1. In a low noise loop antenna means for use with an automatic direction finder, wherein the loop antenna means is comprised of two orthogonal windings and two preamplifiers, one for each said winding, each said preamplifier comprising: a JFET transistor push-pull circuit having at least first and second JFET transistors having source electrodes connected together; means connecting one said winding across the gate electrodes of said transistors; a resistor feedback circuit connecting respectively the drain electrodes of each of said JFET transistors to its associated gate electrode; and output means connected between the drain electrodes of said first and second JFET transistors, the output signal of said preamplifier being taken across said output means; and including means for adjusting the gain of said preamplifiers to be equal to one another; and additionally including first means for mixing the output signal of one preamplifier with a first square wave of predetermined repetition frequency and second means for mixing the output signal of the other preamplifier with a second square wave of the same predetermined frequency but shifted by 90 degrees in phase with respect to said first square wave.

4,158,844

CONCEALABLE ANTENNA MOUNT FOR CB ANTENNAS

Harvey L. Wood, 5411 Manor Creek La., Houston, Tex. 77018

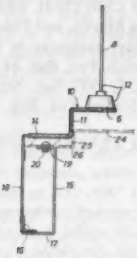
Filed Mar. 18, 1976, Ser. No. 668,321
Int. Cl.[2] H01Q *1/32*
U.S. Cl. 343—715 **26 Claims**

13. An antenna mount for mounting an antenna adjacent the juncture between the lid of the trunk of an automobile and the body of the automobile, comprising:

a first portion having means thereon adapted for rigid attachment inside the trunk, and

a second portion pivotally attached to the first portion, including a segment adapted to traverse said juncture and a segment adapted to mount said antenna,

the pivotal attachment being such that when the first portion is attached inside the trunk, the second portion can be



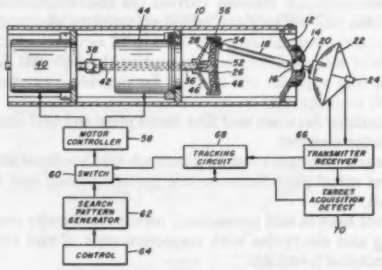
pivoted to move the antenna between a normal outside position and a concealed position within the trunk.

4,158,845

NON-GIMBALED POINTER AND TRACKING PLATFORM ASSEMBLY

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 31, 1978, Ser. No. 891,982
Int. Cl.[2] H01Q *3/10*
U.S. Cl. 343—759 **9 Claims**



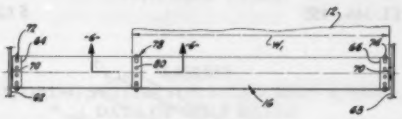
1. Apparatus for mounting a sensor adapted to search an area in two dimensions for a target located at some unknown point, comprising a mounting plate for said sensor, a shaft secured at one end to said mounting plate, means mounting said shaft intermediate its ends for simultaneous movement in two directions whereby the axis of said shaft can be made to intersect any point in a field of view, a rotatable plate having a face formed with a generally spiral groove which receives the end of said shaft opposite said mounting plate, a member between said plate and mounting means and carried for rotation about an axis extending through the central axis of said spiral groove, a slot in said member extending radially outwardly from the axis of rotation of the member and through which said shaft extends, and separate means for independently rotating said plate and said slotted member.

4,158,846

CONVERTIBLE GRAPHIC RECORDER

James F. Gordon, Saratoga, Calif., assignor to Zeta Research, Inc., Lafayette, Calif.

Filed Jan. 11, 1978, Ser. No. 868,523
Int. Cl.[2] G01D *15/24*; G03B *1/24*; B65H *17/42*
U.S. Cl. 346—136 **14 Claims**

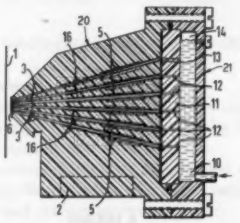
1. In a graphic recorder for use with multiple width strip charts having positioning openings formed along the charts, said recorder having an information transfer head for transferring information to the charts, including the combination of a rotatable drum for transporting the strip chart along a path adjacent the information transfer head, means forming axially spaced-apart first and second sets of sprocket teeth about the drum for releasably engaging the positioning openings on a first chart of given width, means forming a third sprocket detachably mounted on the drum at a position axially spaced from both the first and second sets of sprocket teeth, said third

sprocket including a third set of sprocket teeth for releasably engaging positioning openings along a second strip chart of a width which differs from said given width, said first chart being used in the recorder when the third sprocket is detached from the drum and said second chart being used in the recorder when the third sprocket is mounted on the drum.

4,158,847

PIEZOELECTRIC OPERATED PRINTER HEAD FOR INK-OPERATED MOSAIC PRINTER UNITS

Joachim Heinzl, and Erich Kattner, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 727,038, Sep. 27, 1976, abandoned. This application Apr. 5, 1978, Ser. No. 893,614
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1975, 2543451
Int. Cl.[2] G01D *15/16*; B41J *3/04*
U.S. Cl. 346—140 R **10 Claims**



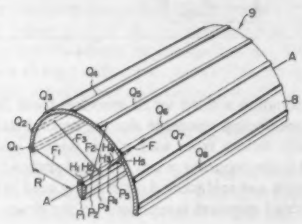
1. In a piezoelectrically operated printer head for an ink-jet printing unit with printing jets, each printing jet having a compression chamber containing a printing liquid and being cylindrically surrounded by a cylindrical piezoelectric drive element so that a droplet of printing liquid is ejected by a piezoelectric contraction of the drive element, the improvement comprising the printer head having a body with a plurality of printing jets arranged in a pattern at a printing location on one surface of the head, a common ink supply distributor carried on said head, each printing jet comprising an individual passage extending in a straight line through the body from an orifice at the printing location to said common ink supply distributor, each passage having a first segment of its length surrounded by a cylindrical piezoelectric drive element, said first segments being spaced from the printing location by a second segment of the passage, said passages being disposed in the printer head to extend away from the pattern of orifices at the printing location in a radiating pattern without any kinks therein so that the pattern of jet orifices has the required close spacing without the piezoelectric drive elements of adjacent passages being in physical interference with each other.

4,158,848

ELECTROSTATIC RECORDING MULTI-STYLUS ELECTRODE DEVICE

Kazumi Ishima, Kashiwa, Japan, assignor to Ricoh Co., Ltd., Japan

Filed May 26, 1978, Ser. No. 910,011
Claims priority, application Japan, May 31, 1977, 52-63539
Int. Cl.[2] G03G *15/04*
U.S. Cl. 346—155 **5 Claims**



1. In an electrostatic recording multi-stylus electrode device for use with a facsimile apparatus or the like, the improvement comprising:

multiple stylus electrodes embedded in at least one row in an electrode support member,

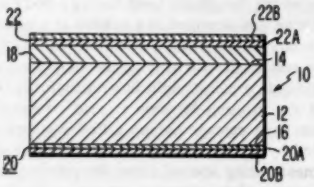
a plurality of common connecting conductive members arranged at substantially equal distances from the row of said stylus electrode, parallel to each other with substantially equal spacings therebetween, a curved insulating base plate supporting said connecting conductive members, and lead wires connecting said multiple stylus electrodes to said common connecting conductive members.

4,158,849

HETEROJUNCTION SEMICONDUCTOR DEVICE

Frank Z. Harwylo, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,705
Int. Cl.[2] H01L *29/161*
U.S. Cl. 357—16 **4 Claims**



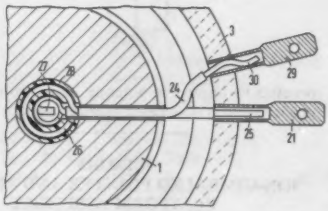
1. A heterojunction semiconductor device comprising a body of indium phosphide and a layer of germanium on a surface of the indium phosphide body and forming a blocking junction therebetween.

4,158,850

THYRISTOR HAVING IMPROVED COOLING AND IMPROVED HIGH FREQUENCY OPERATION WITH ADJACENT CONTROL TERMINALS

Erhard Lehmann; Heinz Martin, and Peter Voss, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 5, 1977, Ser. No. 822,248
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1976, 2636631
Int. Cl.[2] H01L *29/74*
U.S. Cl. 357—38 **10 Claims**



1. A thyristor comprising:

a first metal plate;

a second metal plate;

a conductive foil on said second metal plate;

an insulating ring connecting said first and second metal plates and therewith forming a housing;

a semiconductor element carried on said conductive foil within said housing and including a control electrode and a control current amplifier having an auxiliary electrode;

a pair of electrical terminals extending through said insulating ring adjacent one another for providing external circuit connections;

an insulator between said first metal plate and said semiconductor element;

passageway means extending through said insulator and said first metal plate between said electrodes and said terminals; and

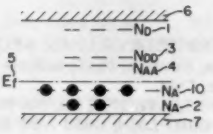
control lines in said passageway means electrically connecting said electrodes with respective ones of said adjacent electrical terminals.

4,158,851

SEMI-INSULATING GALLIUM ARSENIDE SINGLE CRYSTAL

Shin-ichi Akai; Yasuhiro Nishida, and Keiichiro Fujita, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Filed Mar. 22, 1977, Ser. No. 780,186
Claims priority, application Japan, Mar. 29, 1976, 51-34811; Mar. 29, 1976, 51-34812
Int. Cl.[2] H01L *29/167*
U.S. Cl. 357—63 **4 Claims**



1. A semi-insulating gallium arsenide single crystal containing at least one of deep acceptor impurities and at least one of deep donor impurities and having a resistivity of at least about 10^6 Ω-cm at 300° K., in which (1) at least one of the deep donor

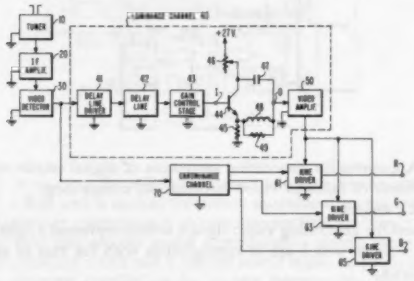
impurities is oxygen, the oxygen concentration in the single crystal being at least about 4×10^{16} cm^{-3}, while the silicon concentration in the single crystal is simultaneously at most about 2×10^{15} cm^{-3}, (2) at least one of the deep acceptor impurities is chromium in a concentration of at least about 1×10^{17} cm^{-3} so as to satisfy the relation of $N_{AA}-N_D'>N_D-N_A>-N_{DD}+N_A'$ in the region of at most about 200 A from the surface of the single crystal when annealed at 700°-900° C., wherein N_D' and N_A' represented respectively the concentrations of relatively shallow donors including vacancies of Group V elements and relatively shallow acceptors including vacancies of Group III elements, which are formed when the single crystal is annealed at 700°-900° C., and wherein N_{DD}, N_{AA}, N_D and N_A are as defined below, and (3) at least one of tellurium, tin, selenium and sulfur is contained as another shallow donor impurity than silicon, said ingredients all being present in such amounts as to satisfy the relationship of $N_{AA}>N_D-N_A>-N_{DD}$ wherein N_{AA} represents the sum of concentrations of the deep acceptor impurities including chromium, N_{DD} represents the sum of concentrations of the deep donor impurities including oxygen, N_D represents the sum of concentrations of the shallow donor impurities including electrically active lattice defects and N_A represents the sum of concentrations of the shallow acceptor impurities including electrically active lattice defects.

4,158,852

VIDEO SIGNAL TRANSLATING CIRCUIT

Wayne E. Harlan, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 11, 1978, Ser. No. 904,777
Int. Cl.[2] H04N 9/535
U.S. Cl. 358—35 **8 Claims**



1. A signal translating stage for video signals comprising, in combination:

a phase splitter, having an input responsive to said video signals and a pair of resistive load impedances, for developing oppositely phased versions of said video signals across respective ones of said pair of resistive load impedances;

an output terminal for said signal translating stage;

means, including a first reactive impedance, for coupling signals developed across one of said load impedances to said output terminal;

means, including a second reactive impedance, opposite in reactance sign to said first reactive impedance, for coupling signals developed across the other of said load impedances to said output terminal;

wherein the parameters of said reactive impedances are selected to cause said signal translating stage to exhibit a non-linear delay-versus-frequency characteristic having a desired shape over the range of fequencies occupied by said video signals; and

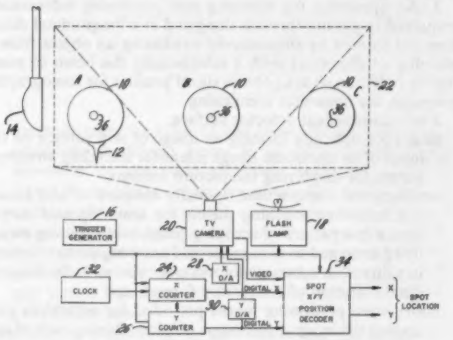
means for varying the amplitude-versus-frequency response characteristic of said signal translating stage without substantial disturbance of the shape of the delay-versus-frequency characteristic thereof, said last-named means comprising means for varying the value of said one resistive load impedance.

4,158,853

MONITORING SYSTEM FOR MEASURING KINEMATIC DATA OF GOLF BALLS

Paul F. Sullivan; Randall W. Moore, both of Acushnet; Hoyt C. Hottel, Jr., Mattapoisett; Raymond G. Pelletier, New Bedford; William Gobush, North Dartmouth, and Francis deS. Lynch, Mattapoisett, all of Mass., assignors to Acushnet Company, New Bedford, Mass.

Filed Sep. 12, 1977, Ser. No. 832,563
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—93 **10 Claims**



1. A system for monitoring a moving sports object comprising:

(a) at least one electro optical sensor;

(b) at least one passive spot of retroreflective material affixed to said sports object covering substantially less than half the projected area of said sports object;

(c) a first light source having its illumination axis no more than 10 degrees from the line of sight of said electro optical sensor to said retroreflective material;

(d) a second light source having its illumination axis no more than 10 degrees from the line of sight of said at least one electro optical sensor to said retroreflective material;

(e) said retroreflective material and each of said first and second light sources enhancing the contrast of said at least one passive spot with the surface of said sports object by a factor of at least 2 to 1;

(f) means for triggering each said light source into operation at least once while said at least one spot is moving and within the field of view of said electro optical sensor;

(g) said first light source being triggered into operation by said means for triggering at a first time during the initial flight of said sports object;

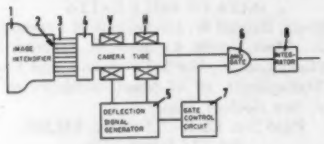
(h) said second light source being triggered into operation by said means for triggering at a second time during the initial flight of said sports object, the time between said first and second times being known; and

(i) electronic means for generating first and second digital numbers representative of the relative position of said at least one spot along first and second axes respectively within the field of view of said at least one electro optical sensor at each of the times said first and second light sources are triggered into operation.

4,158,854
APPARATUS FOR SCANNING AND PROCESSING INFORMATION OBTAINED BY SUCCESSIVELY IRRADIATING AN OBJECT FROM A PLURALITY OF DIRECTIONS

Simon Duinker, Bloemendaal, Netherlands, assignor to N.V. Optische Industrie "De Oude Delft", Netherlands

Filed Oct. 6, 1977, Ser. No. 839,882
Claims priority, application Netherlands, Oct. 15, 1976, 7611419
Int. Cl.[2] H04N 5/32
U.S. Cl. 358—111 7 Claims



1. An apparatus for scanning and processing information contained in picture formats elongated in a longitudinal direction and formed by successively irradiating an object from a plurality of directions with a substantially flat beam of penetrating radiation so as to obtain signal profiles for tomographic purposes, the apparatus comprising

a two-dimensional detector surface,

means for optically forming an image of said surface on the input of an electronic image intensifer including an output screen for displaying the picture formats,

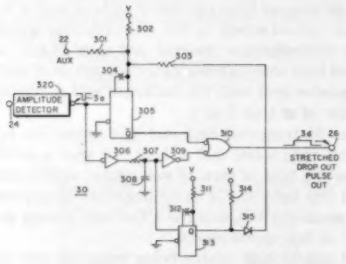
an electronic camera tube optically coupled to said screen and including scanning means for scanning said output screen in a pattern of scanning paths, said scanning means being arranged so as to cause said scanning paths to extend in a direction substantially traverse relative to the longitudinal direction of the picture formats and

information processing means provided for separately processing the image information obtained during each of said scanning paths.

4,158,855
DROPOUT COMPENSATOR WITH PROPORTIONAL DURATION DROPOUT DETECTOR

Robert G. Thomas, Philadelphia, Pa., and Koichi Sadashige, Berlin, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 29, 1977, Ser. No. 855,709
Int. Cl.[2] H04N 5/76
U.S. Cl. 358—127 3 Claims



1. A video signal processing system for providing dropout compensation for a video signal comprising:

a source of video signals;

means responsive to said source of video signals for developing a source of replacement video signals;

means responsive to said source of video signals for generating a first signal of a duration equal to said signal dropout;

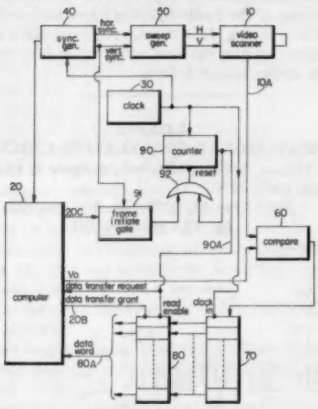
means responsive to said first signal for developing a stretched dropout control signal of a duration equal to said first signal plus a varying stretched duration proportional to the duration of said first signal; and

switch means coupled to said source of video signals and to said source of replacement video signals being responsive to said stretched dropout control signal for substituting one of said source of video signals or said replacement video signals for the other in the presence of said stretched dropout signal.

4,158,856
APPARATUS AND METHOD FOR GENERATING DIGITAL WORDS REPRESENTATIVE OF VIDEO INFORMATION

Billy J. Tucker, Skillman, N.J., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed May 18, 1977, Ser. No. 797,953
Int. Cl.[2] H04N 7/12
U.S. Cl. 358—133 18 Claims



1. Apparatus for generating sequences of digital words representative of fields of video information, comprising:

clock means;

means for generating video signals which represent a field of scanlines which are in synchronism with the rate of said clock;

means for comparing, at the clock rate, the video signal level with a reference level, and for generating a binary bit as a function of each comparison;

means sychronized with said clock rate for serially accumulating a group of N successive binary bits; and

means for reading out, in parallel and as a single N-bit digital word, each such accumulated group of binary bits.

4,158,857
JITTER MEASURING APPARATUS

Seisuke Hiraguri, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 23, 1978, Ser. No. 880,387
Claims priority, application Japan, Feb. 24, 1977, 52-18716
Int. Cl.[2] H04N 9/62
U.S. Cl. 358—139 8 Claims

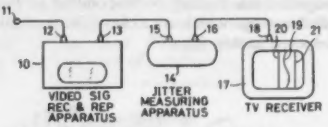
1. An apparatus for measuring jitter of a television receiver, said apparatus comprising:

means for detecting a jitter component in an input signal which includes the jitter component;

means for generating a vertically extending and horizontally swaying jitter indicating line signal in response to the detected jitter component, means for supplying said jitter indicating line signal to the television receiver which

displays said jitter indicating line as a vertically extending and horizontally swaying picture on the screen of the television receiver; and

means for generating at least one reference line signal at a



time point which is deviated from the jitter indicating line signal, means for supplying said reference line signal to the television receiver which displays said reference line at a vertically extending reference position relative to the jitter indicating line appearing on the picture screen.

4,158,858

TELEVISION SYSTEM WITH TWO FM SOUND CARRIERS

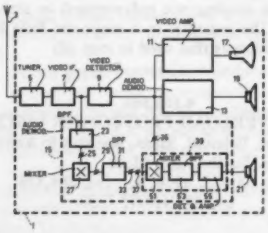
Peter J. H. Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 30, 1978, Ser. No. 873,730

Claims priority, application Netherlands, Feb. 28, 1977, 7702110

Int. Cl.² H04N 7/00

U.S. Cl. 358—143 **4 Claims**



1. A receiver for television signals having a picture carrier and a first and a second frequency-modulated sound carrier, the receiver comprising a picture intermediate frequency section, first and second sound demodulation circuit means for demodulating a first and a second sound signal respectively, a first detector coupled to the picture intermediate frequency section, said first sound demodulation circuit means being coupled to said first detector, the second sound demodulation circuit comprising a first bandpass filter means coupled to the picture intermediate frequency section for selecting the two sound carriers from the signal of the picture intermediate frequency section, a first mixing stage means coupled to an output of the first bandpass filter for mixing the first and the second sound carrier, and a second bandpass filter means coupled to the output of the mixing stage and having a center passband frequency which corresponds to the frequency interval between the first and the second sound carrier for selecting said frequency interval from the output of the mixing stage.

4,158,859

AUTOMATIC CONTROL OF IRIS AND CLAMPING VOLTAGE IN VIDEO SIGNAL GENERATOR

Sheldon J. Kerbel, Merrick, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,773

Int. Cl.² H04N 5/26, 5/193; G06G 7/18

U.S. Cl. 358—228 **19 Claims**

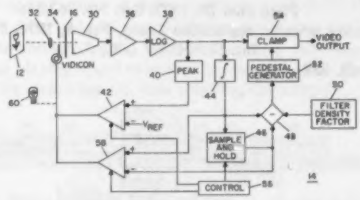
1. Signal processing apparatus, for use in conjunction with a signal transforming apparatus which transforms a supplied input signal, the amplitude of which contains desired information when related to a given reference level, into a corresponding amplitude varying output signal in accordance with a predetermined signal transform characteristic, said transforming apparatus having a preferred range of input signal amplitudes, comprising:

means, responsive to the output signal of said transforming apparatus and to supplied control signals, for modifying the amplitude of the signal supplied to the input of said signal transforming apparatus;

means, responsive to the output signal of said transforming apparatus, for generating an amplitude signal which is a selected function of the amplitude of said output signal;

controlled storage means for storing the value of said amplitude signal;

means for controlling the operation of said amplitude modifying means and said storage means to cause said storage



means to store the value of said amplitude signal with said amplitude modifying means in an initial condition and thereafter to cause said amplitude modifying means to adjust the amplitude of the signal supplied to the input of said transforming apparatus to be within said preferred range, thereby adversely affecting the reference level in said input signal and, therefore, the corresponding reference level in said output signal so that the amplitude of said output signal may not accurately represent said desired information;

and means, responsive to said amplitude signal and the stored value of said amplitude signal, for changing a characteristic of said output signals to restore the reference level therein so that the amplitude of said changed output signal, when related to said restored reference level, accurately represents the desired information in said input signal.

4,158,860

METHOD FOR DRIVING AN X-Y MATRIX TYPE LIQUID CRYSTAL DISPLAY PANEL

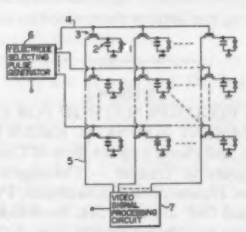
Hiroyuki Irie, Osaka; Susumu Ide, Katano, and Tamotsu Matsuo, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 12, 1977, Ser. No. 832,480

Claims priority, application Japan, Sep. 20, 1976, 51-113456

Int. Cl.² H04N 5/66; G02F 1/28

U.S. Cl. 358—230 **6 Claims**



1. A method for driving by means of the line at a time process an X-Y matrix type liquid crystal panel having both

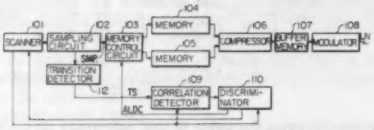
switching elements and memory elements for respective picture elements comprising the steps of: dividing each horizontal scanning period into two periods, a video signal period and an erasing signal period; forming a composite signal having a video signal as one portion thereof and an erasing signal as another portion thereof; writing said video signal on said panel by means of a first pulse corresponding to said video signal period; and applying said erasing signal to said panel by means of a plurality of second pulses corresponding to said erasing signal period thereby to erase said panel.

4,158,861

FACSIMILE COMMUNICATION SYSTEM AND METHOD

Yoshio Iizuka, Sagamihara, Japan, assignor to Fujitsu Limited and Matsushita Graphic Communication Systems, Inc., both of, Japan

Filed Jan. 28, 1977, Ser. No. 763,516
Claims priority, application Japan, Feb. 5, 1976, 51-12053
Int. Cl.[2] H04N *1/40, 7/12*
U.S. Cl. 358—260 **25 Claims**



1. A facsimile communication system for developing facsimile information contained in a document for transmission, for transmitting said facsimile information as a type of signal containing facsimile information for selected scanning lines and no facsimile information for unselected scanning lines, and for recovering facsimile information contained in said transmitted signal, said system comprising:

scanning means for scanning the document in accordance with predetermined scanning lines to provide signals corresponding to the facsimile information for each scanning line;

first determining means for determining, in transmission by discrimination, the pattern density of the facsimile information of each said scanning line;

selecting means for selectively selecting or not selecting each scanning line in accordance with the corresponding pattern densities determined by said determining means;

modulating means for modulating only the facsimile information contained in each said selected scanning line;

demodulating means for demodulating said received signal to obtain said facsimile information contained in said received signal;

second determining means for determining, in accordance with analyzing said demodulated facsimile information, a scanning line density for said received signal so as to detect said selected and unselected scanning lines; and

controllable supplying means for controllably supplying said facsimile information for reproduction in accordance with said scanning line density determined by said determining means.

4,158,862

SELECTIVE FIXATION METHOD FOR PRODUCING PERMANENT MAGNETIC RECORDINGS

André Michaud, and Pierre Eymard, both of Chatenay Malabry, France, assignors to Transac — Compagnie pour le Developpement des Transactions Automatiques, Paris, France

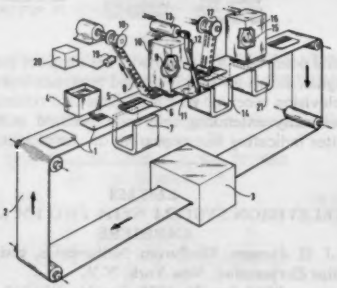
Filed Oct. 27, 1977, Ser. No. 846,088
Claims priority, application France, Nov. 4, 1976, 76 33331
Int. Cl.[2] G11B *13/04, 5/02;* **G03G** *19/00*
U.S. Cl. 360—56 **7 Claims**

1. A method for producing permanent magnetic recordings, said method comprising the steps of:

(a) coating a support with a polymerizable magnetic ink;

(b) while the ink is still fluid, subjecting the magnetic ink to a magnetic field to orient the magnetic particles contained in the ink in a predetermined direction;

(c) selectively polymerizing, by irradiation, certain areas of the magnetic ink coating corresponding to parts of the recorded message which are to have the magnetic orientation imposed in step (b);



(d) subjecting the magnetic ink to a differently oriented magnetic field to orient the magnetic particles in the unpolymerized areas of the magnetic ink coating in a direction different to that imposed in step (b); and

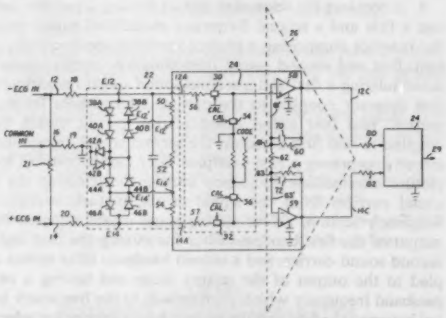
(e) polymerizing, by irradiation, at least those areas of the magnetic ink coating not polymerized in step (c) while maintaining the particles in a magnetic field having the same orientation as that used in step (d).

4,158,863

INPUT OVERLOAD PROTECTION CIRCUIT

Thomas K. Naylor, Belmont, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Mar. 7, 1978, Ser. No. 884,326
Int. Cl.[2] H02H *7/20*
U.S. Cl. 361—56 **6 Claims**



1. An input overload protection circuit comprising:

a high impedance differential amplifier having a pair of inputs;

a pair of input conductors operatively connected to said respective pair of inputs of said differential amplifier for conducting signal thereto;

a third conductor connected to a reference potential;

a first serial plurality of diode-action clamping means connected intermediate one conductor of said pair and said third conductor;

a second serial plurality of diode-action clamping means connected intermediate the other conductor of said pair and said third conductor; and

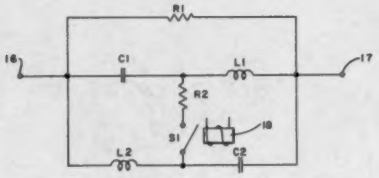
guard means responsive to the respective signal voltage at that end of said respective first and second plurality of clamping means connected respectively to said one and said other conductors of said pair for applying substantially said respective signal voltage to said respective first and second plurality of clamping means intermediate the respective ends thereof, thereby to substantially prevent leakage current from flowing through said clamping means from said pair of conductors.

4,158,864

FAULT CURRENT LIMITER

Richard E. Kennon, Sunnyvale, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jul. 5, 1977, Ser. No. 812,723
Int. Cl.[2] H02H *3/08*
U.S. Cl. 361—58 **4 Claims**



1. An electrical circuit connected in a line between an AC power source and a load for limiting fault current in the load, comprising

first and second parallel connected paths each containing a series connected inductance-capacitance combination tuned to resonate at the AC power frequency,

means comprising first and second series connected switches connected between the common inductance-capacitance nodes in said first and second parallel paths being actuated to a conducting condition by fault current, whereby said first and second paths are detuned and provide a high impedance in the line, and

means for limiting the voltage across each capacitance in said first and second parallel paths, whereby the magnitude of switching transients across each capacitance is limited, said means for limiting comprising a multi-element resistor connected in parallel with said first and second parallel paths, said first and second switches operating to connect a first and second resistor in said multi-element resistor in parallel with the capacitance in said first and second parallel paths respectively.

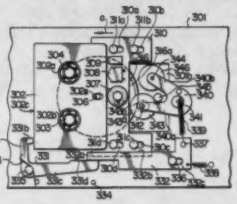
4,158,865

AUTOMATIC SWITCHING DEVICE FOR CASSETTE TAPE RECORDER

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Continuation of Ser. No. 645,458, Dec. 30, 1975, abandoned. This application Oct. 13, 1977, Ser. No. 841,758
Claims priority, application Japan, Jan. 24, 1975, 50-11244[U]; Jan. 24, 1975, 50-11245[U]; Jan. 31, 1975, 50-13564; Jan. 31, 1975, 50-15146[U]; Feb. 19, 1975, 50-23005[U]; Feb. 20, 1975, 50-21648
Int. Cl.[2] G11B *15/44, 15/46*
U.S. Cl. 360—73 **12 Claims**

1. Automatic switching device for a cassette tape recorder adapted for use with a tape cassette of the type having a detection opening formed in the sidewall thereof which indicates a desired one of a plurality of possible tape playing speeds; the changer comprising a detection member for detecting the presence or absence of the detection opening in the cassette loaded in the tape recorder, a first idler, a second, stepped idler having a pair of portions of different diameters, one of the idlers being selectably located in the path of the transmission of drive from a drive source to a capstan which propels the tape at the said playing speed in accordance with the idler selected, the both idlers being carried by a support plate which is pivotally mounted, and an idler switching spring having a line of



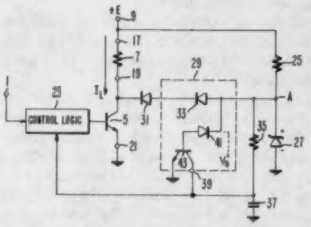
action, the line of action of the spring being shifted from one side to the other side of the pivot in accordance with the presence or absence of the detection opening whereby the desired tape playing speed indicated by the detection opening is effected by switching and thus selecting the idler.

4,158,866

PROTECTION CIRCUIT FOR TRANSISTORIZED SWITCH

Richard H. Baker, Bedford, Mass., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 30, 1977, Ser. No. 855,994
Int. Cl.[2] H02H *3/26*
U.S. Cl. 361—86 **28 Claims**



1. A switching amplifier circuit comprising:

a first terminal for receiving a first DC operating voltage, and for connection to one end of a load;

a second terminal for receiving a source of reference potential;

switching transistor means having a control electrode, for receiving a control signal, a first electrode for connection to the other end of said load, and a second electrode connected to said second terminal, said switching transistor means being responsive to the presence of a control signal for substantially lowering the impedance between its first and second electrodes, thereby providing a current conduction path therebetween;

fault signal producing means connected to said first electrode and receptive of a second DC operating voltage greater in value than the saturation voltage of said switching transistor means, responsive directly to the level of voltage between said first and second electrodes approaching to within a predetermined differential of said second operating voltage, for at least a predetermined duration of time, for producing a fault signal;

control means both responsive to a turnon signal, for producing and applying said control signal to said control electrode of said switching transistor means, for placing the latter into a conductive state, and thereafter responsive to said fault signal, for removing said control signal

from said control terminal, to turn off said switching means.

4,158,867
VIDEO DISC PLAYER

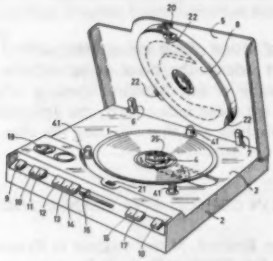
Adrianus C. Tops, Eindhoven, and Johannes A. Iemenschot, Zwolle, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 15, 1978, Ser. No. 905,879

Claims priority, application Netherlands, Feb. 10, 1978, 7801533

Int. Cl.[2] G11B *5/52*

U.S. Cl. 360—99 **3 Claims**



1. A video disc player for playing back round rapidly rotating video discs and comprising:

a housing with a deck plate,

a motor-driven drive spindle, which projects from the deck plate, for rotating a video disc parallel to the deck plate,

a cover movable between an open first position and a closed second position,

a stabilizing disc attached to said cover and which is movable between a first and a second position corresponding to said first and second positions of said cover and which in the last-mentioned position at least substantially covers a video disc placed on the drive spindle in a position proximate thereto, for stabilizing the shape of a video disc during rotation, which stabilizing disc in its second position extends substantially perpendicularly to the drive spindle axis and is disposed at a small distance from a video disc which is disposed on the drive spindle,

means comprising at least one air inlet restriction for, during playback of a video disc admitting an air stream which is limited to a specific magnitude between the stabilizing disc and the rotating video disc and thus reducing the air pressure between said rotating video disc and said stabilizing disc, air-valve means comprising a valve body and a valve seat for closing an air by-pass passage during playing of a video disc when said cover is closed and for opening the air by-pass passage when said cover is opened and playing of a video disc is discontinued, so as to admit an increased air stream between the stabilizing disc and a rotating video disc in order to substantially increase the pressure between said rotating video disc and said stabilizing disc and to prevent the video disc from being drawn along when the stabilizing disc is moved from its second to its first position.

4,158,868
UNIVERSALLY ADJUSTABLE HEAD SUPPORT FOR TAPE DECK

John P. Jenkins, Towanda, Ill., assignor to International Tapetronics Corporation, Bloomington, Ill.

Filed Feb. 7, 1978, Ser. No. 875,866

Int. Cl.[2] G11B *21/24*

U.S. Cl. 360—109 **15 Claims**

1. In a tape transport mechanism, a frame having a tape trained for movement along a path past transducer means consisting of at least one head, means enabling universal adjustment movement of said head relative to the tape comprising:

a mounting block member and means supporting said head thereon with the centerline of the head normal to the plane of the tape;

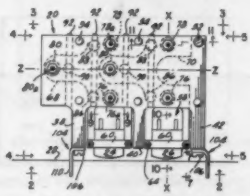
a base member on said frame;

means connecting said mounting block member to said base member comprising spring means, and first and second adjusting screw means;

said spring means being connected to urge said members toward one another;

said screw means including three spaced, parallel screws each threadedly engaging one of said members and having ball-shaped thrust means seated by said spring means against the other of said members;

said first screw means consisting of a pair of said screws having axes intersecting the centerline of the head, the



pair of said ball-shaped thrust means of said pair of screws being located along the centerline of the head to thereby establish an azimuth axis along said pair of ball-shaped thrust means;

said second screw means consisting of the third of said three screws, the axis of which is offset from said azimuth axis, said axis of said third screw intersecting a line which is perpendicular to said azimuth axis to thereby establish a zenith axis at right angles to the azimuth axis;

whereby the zenith of said head relative to the tape is changed by adjusting either or both of said pair of screws to tilt said mounting block member about said zenith axis;

whereby further the azimuth of said head relative to the tape is changed by adjusting said third screw to tilt said mounting block about said azimuth axis; and

whereby still further the transverse position of the head relative to the tape is changed by adjusting all three screw members.

4,158,869
LINE PROTECTOR

Alexander G. Gilberts, Algonquin, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

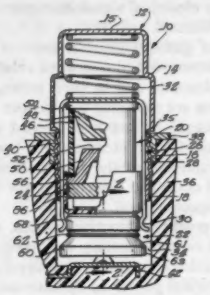
Filed Aug. 19, 1977, Ser. No. 826,035

Int. Cl.[2] H02H *3/22*

U.S. Cl. 361—118 **9 Claims**

7. A line protector having a primary surge arrester of the cold cathode gas tube type and a secondary surge arrester of the air gap type, the breakdown voltage of the secondary arrester being greater than the breakdown voltage of the primary arrester, said arresters being housed together and being connected to form parallel electric circuits from a line to be protected to ground, said secondary arrester having its air gap defined by two facing electrodes separated by an insulator, a contactor projecting through both facing electrodes and normally being in electrical contact with only one of said elec-

trodes, and means including a spring interposed between the contactor and one of said electrodes for drawing said facing



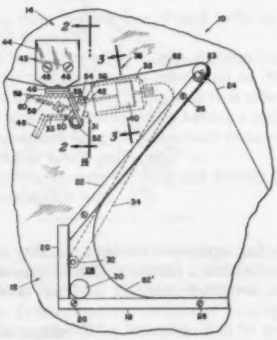
electrodes tightly against said insulator to establish and maintain the magnitude of said air gap.

4,158,870

REFLECTING MEANS FOR VISUAL INSPECTION OF MAGNETIC TAPE HEAD

Floyd R. Ysbrand, and Robert L. Crafts, both of Tulsa, Okla., assignors to Telex Computer Products, Inc., Tulsa, Okla.

Continuation-in-part of Ser. No. 216,092, Jan. 7, 1972, Pat. No. 3,838,463. This application Mar. 12, 1974, Ser. No. 450,332
The portion of the term of this patent subsequent to Sep. 24, 1991, has been disclaimed.
Int. Cl.[2] G11B *5/48, 21/24*
U.S. Cl. 360—128 **10 Claims**



1. In a magnetic tape transport system including a magnetic head, a magnetic tape, and means to drive and guide said tape past said head, the improvement comprising:

(a) reflecting means spaced from said magnetic head for reflecting the image thereof to facilitate a visual inspection of the condition of the magnetic head;

(b) flux shield means operable between a first position in which it is adjacent said tape opposite said magnetic head, and a second position in which it is away from said tape, said reflecting means providing a reflected image of said magnetic head when the flux shield is in said second position;

(c) at least one vacuum column, said drive means operable for driving the magnetic tape from said vacuum column past said head; and

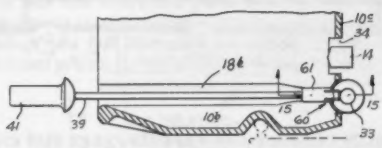
(d) vacuum actuator means cooperating with said flux shield means for positioning thereof in said first and second positions.

4,158,871

KIT FOR SERVICING TAPE CARTRIDGE PLAYBACK UNIT

Raymond C. Leaming, 721 S. Washington, Liberal, Kans. 67901

Continuation-in-part of Ser. No. 609,009, Aug. 29, 1975, Pat. No. 4,065,801. This application Dec. 21, 1977, Ser. No. 862,919
The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.
Int. Cl.[2] G11B *5/41;* A47L *25/00*
U.S. Cl. 360—137 **39 Claims**



1. A kit adapted to be used with a cartridge tape playback unit having a plurality of components which may need servicing and including an opening for receiving a cartridge enclosed tape, which comprises:

a hollow cartridge case having a substantially open front end for providing unobstructed viewing of said components when said cartridge case is inserted in said opening;

separate, non-affixed tool holder means for mounting at least one service head for servicing at least one of said components; and

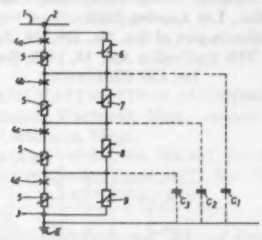
access means in the rear end of said cartridge case for permitting said tool holder means to pass through said cartridge case from said open front end and selectively service said at least one of said components.

4,158,872

SURGE DIVERTER

Viktor Stephanides, Zürich, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed Nov. 23, 1977, Ser. No. 855,151
Claims priority, application Switzerland, Nov. 24, 1976, 14781/76
Int. Cl.[2] H02H *3/22*
U.S. Cl. 361—128 **4 Claims**

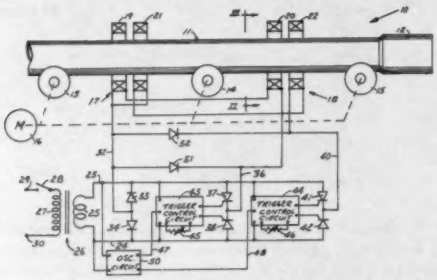


1. In a surge diverter connected between a conductor terminal and ground comprising several spark-quenching gaps voltage-controlled discharge resistors connected in series with said gaps and voltage-controlled control-resistors each of which is connected in parallel either with a spark-quenching gap or with the serial unit formed by a spark-quenching gap and a discharge resistor mounted in series, the improvement wherein the voltage-controlled control-resistors have current-voltage characteristics of substantially the same steepness, and resistance values at the rated voltage which are mutually different and increase sequentially from the conductor terminal to ground.

4,158,873
DEMAGNETIZING METHODS AND APPARATUS

Kenneth W. Schroeder, Arlington Heights; Bruce G. Isaacson, Park Ridge, and Donald E. Lorenzi, Des Plaines, all of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Filed Aug. 31, 1977, Ser. No. 829,442
Int. Cl.[2] H01F *13/00*
U.S. Cl. 361—149 10 Claims

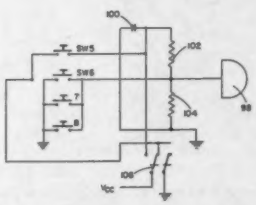


1. In a system for demagnetizing elongated parts of ferromagnetic material having solid portions with transverse dimensions of at least 0.2 inches, coil means arranged to surround a portion of an elongated part, current supply means for supplying pulses of current through said coil means for producing magnetic field pulses of alternating polarity and of substantially constant durations and magnitudes with a substantially constant repetition rate, each of said current pulses being continuous and having substantially constant and unvarying magnitude for a time interval having a duration sufficient to produce a magnetic field in a direction reversed from that produced by the preceding pulse and of a uniform magnitude in all portions of the part positioned within said coil means, and means for supporting and moving the part longitudinally through said coil means to expose each portion of the part to magnetic field reversals of gradually reducing magnitude as the portion moves away from said coil means, each of said current pulses having a duration of on the order of at least 50 milliseconds.

4,158,874
SAFETY INTERLOCK SYSTEM

Thomas R. Ellsberg, North Hollywood, Calif., assignor to C.P.P.L., Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 709,314, Jul. 28, 1976, abandoned. This application Apr. 14, 1978, Ser. No. 896,468
Int. Cl.[2] E05B *49/00*
U.S. Cl. 361—172 23 Claims



1. A safety interlock system to prevent theft or unauthorized removal of a vehicle having an engine system for powering said vehicle with an electrical component forming part of the engine system, said interlock system comprising:

(a) a plurality of manually operable switch elements, each representing a separate indicium of a code for energizing said interlock system to enable operation of said vehicle when a plurality of said switch elements have been actuated in proper sequence to conform to the pre-established sequence of indicia of said code,

(b) means operatively associated with said switch elements to generate an electrical signal in response to actuation of said switch elements,

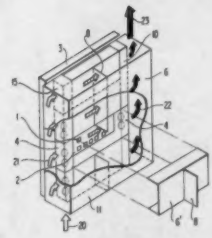
(c) a plurality of gating elements, each of said gating elements being connected in operative relation to certain of said switch elements and in such arrangement that said gating elements are switched to a proper state to generate an enabling signal in response to said electrical signals only when said switch elements are operated in proper sequence to conform to the pre-established sequence of indicia of said code and thereby permit operation of said electrical component, and

(d) a plurality position selection switch operatively connected to said switch elements and having a first position where the interlock system is operatively connected to a source of electrical power to operate said electrical component, said selection switch having a second position where said interlock system is operatively connected to said gating elements to hold said gating elements in a proper state in accordance with the switch elements being operated in proper sequence for a predetermined time period.

4,158,875
AIR COOLING EQUIPMENT FOR ELECTRONIC SYSTEMS

Tsuneaki Tajima, and Yohichi Matsuo, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 23, 1978, Ser. No. 908,612
Claims priority, application Japan, May 24, 1977, 52/60627
Int. Cl.[2] H05K *7/20*
U.S. Cl. 361—384 3 Claims



1. Air cooling equipment having a plurality of printed circuit wiring boards with a plurality of heat-generating electronic components mounted thereon, said air cooling equipment comprising:

a plurality of first covers of a "U" shape which cover said components on said printed circuit wiring boards and are provided in one-to-one correspondence to said printed circuit wiring boards;

first intake ports and first exhaust ports of a plurality of first air passages defined by said first covers and said boards, blowers provided at selected ones of said ports;

a second cover having a second intake port adapted to supply air to said first intake ports through a second air passage provided in the same direction as the direction of air delivered as a coolant in said first air passages, and a second exhaust port adapted to discharge air exhausted from said first exhaust ports of said first air passages in the same direction as that of air from the said second intake port, said second cover defining a third air passage in cooperation with said printed circuit wiring boards to cover said boards therewith; and

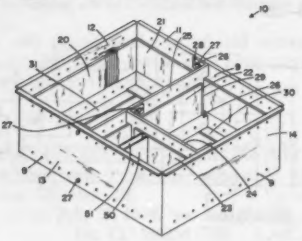
a partition wall secured to said first covers and to said second cover so as to separate air of said second intake port provided in the second cover and said second exhaust port.

4,158,876

CIRCUIT BOARD HOLDER

Alfred J. Pedro, St. Paul, Minn., assignor to Carl Pedro and Sons, Inc., St. Paul, Minn.

Filed Feb. 6, 1978, Ser. No. 875,596
Int. Cl.[2] H02B *1/02*
U.S. Cl. 361—415 6 Claims



1. A holder for circuit boards comprising a first wall having a plurality of spaced openings therein for attachment with a divider;

a second wall having a plurality of spaced openings therein for attachment with a divider;

further walls connecting said first wall to said second wall to produce a housing for supporting and protecting circuit boards located therein;

a first circuit board guide mounted to said first wall, said first circuit board guide having means projecting therefrom for holding circuit boards in an upright spaced condition;

a second circuit board guide mounted to said second wall, said second circuit board guide having means projecting therefrom for holding a circuit board in an upright spaced condition;

a lip extending from at least one of said walls to support a circuit board thereon;

a divider with two ends having flanges thereon for engaging with said first wall and said second wall so that said divider can be firmly connected to said first side walls and said second side walls, said divider having a notch at each end to permit said divider to fit over said means projecting from said circuit board guide; and

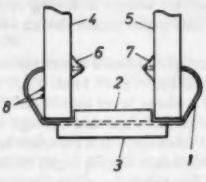
fastening means for securely holding said divider to said first wall and said second wall.

4,158,877

CONNECTING AND SUPPORTING CLAMP FOR TWO ADJACENTLY SITUATED PRINTED CIRCUIT CARDS

Sven T. Peterson, Tyreso, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 30, 1977, Ser. No. 856,046
Claims priority, application Sweden, Dec. 21, 1976, 7614332
Int. Cl.[2] H02B *1/02*
U.S. Cl. 361—412 5 Claims



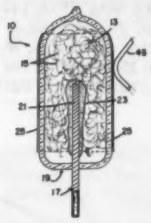
1. An interconnecting and supporting clamp for two adjacently situated printed circuit cards, comprising: a rectangular plate of electrical conducting material having a middle portion; a first leg extending from one end of said rectangular plate at a substantially right angle thereto; a second leg extending from the other end of said rectangular plate at a substantially right angle thereto, said legs and said rectangular plate being of the same material and moulded from the same blank such that the transition from said plate to each of said legs is characterized by a smooth curve; a first connection piece of insulating material rigidly fastened on one side face of said middle portion; and a second connection piece of insulating material rigidly fastened on the other side face of said middle portion, the length of said second connection piece as taken in a direction from said first leg toward said second leg being greater than the length of said first connection piece such that said second connection piece extends beyond said first connection piece at both ends of said first connection piece whereby two adjacently situated printed circuit cards may be supported thereby.

4,158,878

MEANS FOR ELECTRICALLY CONTACTING FLASH LAMP HAVING EXTERNAL CONDUCTIVE COATING

James C. Morris, Wakefield; P. Bruce Newell, Carlisle, and John A. Scholz, Danvers, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 30, 1978, Ser. No. 873,376
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—3 10 Claims



1. In a flash lamp adapted for being electrically activated by an electrical conducting member located externally of said flash lamp wherein said flash lamp includes an envelope having a thin, external conductive coating thereon and a protective, insulative layer over said coating, the improvement comprising:

means for electrically coupling said conductive coating and said external conducting member through a localized region of said insulative layer.

4,158,879

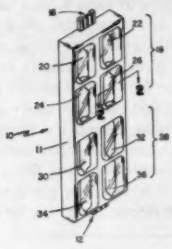
FLIP FLASH HAVING FINAL FLASH SIGNAL

Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 708,487, Jul. 26, 1976, abandoned. This application Jun. 9, 1977, Ser. No. 805,015
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—13 8 Claims

1. In a reversible photoflash unit carrying three terminals, and at least a first array and a second array of photoflash lamps, said lamps of said first array being electrically coupled between a first and a second of said terminals for sequential firing of said lamps of said first array and including a last lamp arranged to be fired last, and said lamps of said second array being electrically coupled between said first terminal and a third of said terminals for sequential firing of said lamps of said second array and including a last lamp arranged to be fired last, the improvement comprising means responsive to flashing of said last lamp of said first array for altering the electrical condition between one of said first or second terminals and said third terminal to provide an electrical condition at said third terminal following completion of lamp firing of said first array, and

said means responsive to flashing of said last lamp of said first array comprises a unidirectional device configured for passing



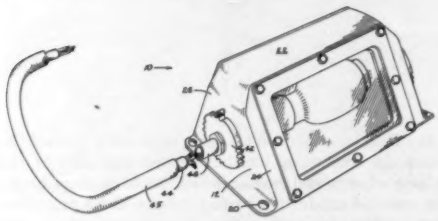
current in one direction to facilitate sensing said electrical condition and for blocking current in the opposite direction.

4,158,880

MINE MACHINE LIGHT

Howard P. McJunkin, Jr., Charleston, W. Va., assignor to McJunkin Corporation, Charleston, W. Va.

Filed Jul. 25, 1977, Ser. No. 818,664
Int. Cl.[2] F21V *15/00*; **H01R** *13/60*; **F21L** *7/00*; **F21V** *23/00*
U.S. Cl. 362—376 **8 Claims**



1. A mine machine light, comprising:

a housing having a unitary body of hollow, generally triangular transverse cross-sectional shape;

said body including a generally rectangular base wall, an outer wall that is generally rectangular, and substantially narrower than said base wall, two generally rectangular sidewalls, each having one respective margin shared with a respective margin of the base wall and an opposite respective margin shared with a respective margin of the outer wall, and a respective generally triangular wall each with an outer margin perimetrically joined to respective ends of the two sidewalls, the base wall and the outer wall;

a light socket within the housing;

gland means in one end wall for sealingly passing an electrical cable through that end wall to connect with the light socket; and

means defining an opening through each sidewall;

means defining an outwardly facing shoulder on each sidewall perimetrically bordering the respective opening, each shoulder being recessed below the exterior of the respective sidewall;

a plate of light transmitting material received in each opening against the respective shoulder to close the respective opening and thus provide a window to the exterior of the housing;

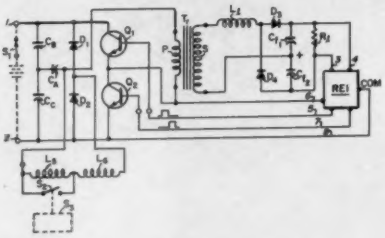
means perimetrically securing each plate against the respective shoulder.

4,158,881

DC TO DC CONVERTER

David H. Simmons, Palo Alto, and Alfredo A. Panelo, San Jose, both of Calif., assignors to Litton Systems, Inc., San Carlos, Calif.

Filed Jun. 12, 1978, Ser. No. 914,755
Int. Cl.[2] H02M *3/335*
U.S. Cl. 363—25 **12 Claims**



1. In a DC to DC converter containing a transformer means, said transformer means including:

a primary winding, and a secondary winding, said secondary winding being loosely coupled to said primary to provide a predetermined effective leakage inductance reflected to said primary winding;

rectifier means connected to said secondary winding for supplying a rectified output;

filter capacitor means coupled to the output of said rectifier means for smoothing said rectified voltage;

means for connecting an electrical load across said filter capacitor means;

second capacitor means, said second capacitor means connected in series circuit with said primary winding;

input means for receiving a DC voltage for conversion to a different DC voltage;

electronic switching means for periodically and alternately charging said second capacitor means with current in a first polarity direction over a first interval of time T followed by charging said second capacitor means with current in a second opposite polarity direction over a second interval of time T in a current path including said primary winding, said charging current derived from a DC voltage at said input means, said second capacitor means being sized relative to said leakage inductance of said transformer means and to the impedance characteristics of said electrical load and to said filter capacitor means for causing said current in said current path to have the waveform essentially of half sinusoids over a portion of each time interval;

clamping diode means coupled to said second capacitor means for limiting the level of voltage across said second capacitor means during each interval of time to below the level applied across said input means; said diode means conducting additional current from said primary winding in shunt of said capacitor means responsive to the voltage across said capacitor means attaining approximately the voltage level of said input means during said time interval; and

regulating means coupled to said electronic switching means for regulating said interval of time, T, or said periodicity as a function of voltage level monitored across said filter capacitor means to maintain said voltage across said filter capacitor means essentially at a constant level irrespective of the voltage variation at said input means;

the improvement for reducing peak current level through said electronic switching means comprising in combination therewith:

inductance means,

said inductance means connected in series circuit between said clamping diode means and said second capacitor means,

said inductance means responsive to said clamping diode means conducting current and to the instantaneous current level through said electronic switch means and primary winding;

said inductance means for partially discharging said second capacitor means in a discharge current path through said clamping diode means prior to said electronic switching means repeating current conduction through said primary winding;

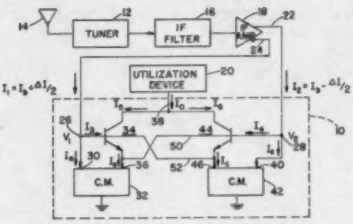
whereby said partial discharge of said second capacitor means provides a reduced level of peak current through said electronic switching means.

4,158,882

FULL-WAVE RECTIFIER CIRCUIT

Richard W. Citta, Oak Park, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Feb. 27, 1978, Ser. No. 881,266
Int. Cl.[2] H02M 7/21
U.S. Cl. 363—127 **4 Claims**



1. A full-wave rectifier circuit comprising:

first and second transistors of like conductivity, the collectors of said transistors being connected together forming an output of said rectifier;

first and second current mirrors each having an input and an output, the emitters of said first and second transistors being connected for supplying said inputs of said first and second current mirrors respectively and the bases of said first and second transistors being connected to said outputs of said first and second current mirrors respectively;

first means coupling the emitter of said first transistor to the base of said second transistor;

second means coupling the emitter of said second transistor to the base of said first transistor; and

means coupling an alternating current signal to the base of at least one of said transistors.

4,158,883

REFRESH CONTROL SYSTEM

Shinji Kadono, Kodaira; Tsuneyo Chiba, Tsukui, and Kiyoshi Umezawa, Owara-asahi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 1, 1976, Ser. No. 737,350
Claims priority, application Japan, Oct. 31, 1975, 50-130462
Int. Cl.[2] G06F 13/00; G11C 7/00
U.S. Cl. 364—200 **15 Claims**

1. A refresh control system comprising:

memory means having a volatile memory for storing data;

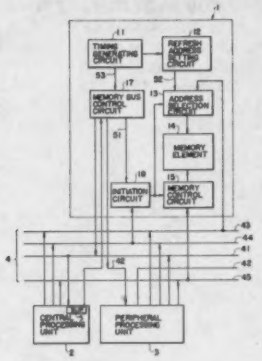
memory control means;

processing means for accessing said memory means via said memory control means to write data into and read data from said memory by generating memory request signals;

a memory bus connected to said memory control means and said processing means for effecting signal transfer between said memory control means and said processing means;

supervision means connected to said memory bus and responsive to a memory request signal from said memory control means for generating a grant signal signifying permission to use said memory bus when it is not in use and for forwarding said grant signal to said memory bus; and

refresh control means included in said memory control means for transferring a memory request signal signifying



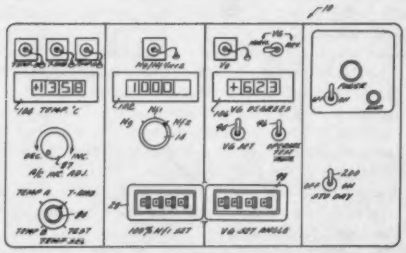
a refresh operation to said supervision means via said memory bus at a predetermined time, and generating a signal commanding the execution of the refresh operation to said memory means in response to said grant signal from said supervision means which is generated in response to said request signal for the refresh operation.

4,158,884

GAS TURBINE ENGINE TRIM TEST SET APPARATUS

Frederick C. McKinley, Mojave, and Ivan R. Anderson, Lancaster, both of Calif., assignors to General Electric Company, Lynn, Mass.

Filed Oct. 31, 1977, Ser. No. 846,957
Int. Cl.[2] G06F 11/04, 15/20
U.S. Cl. 364—431 **38 Claims**



1. A test set for measuring and displaying performance parameters of a gas turbine engine comprising:

(a) a plurality of terminal means, each adapted to receive the analog signal from a separate performance parameter sensor, each analog signal having a value representative of the value of a corresponding performance parameter;

(b) square wave converter means for converting received analog signals into corresponding square waves each having a frequency indicative of the value represented by its corresponding analog signal;

(c) period detector logic means for receiving said square waves and outputting corresponding digital signals, each having a value indicative of its corresponding square wave;

(d) processor means for receiving the digital signals and calculating the value of their corresponding performance parameters; and

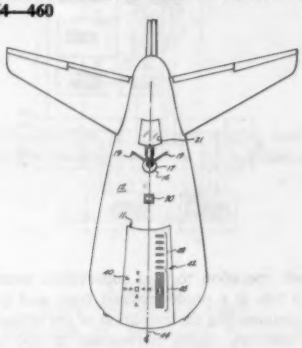
(e) display means for displaying the calculated performance parameter.

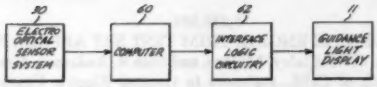
4,158,885

GUIDANCE-LIGHT DISPLAY APPARATUS AND METHOD FOR IN-FLIGHT LINK-UP OF TWO AIRCRAFT

Wayne K. Neuberger, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 9, 1977, Ser. No. 849,940
Int. Cl.[2] G06F *15/50*; G01B *11/27*; G01C *3/06*
U.S. Cl. 364—460 **11 Claims**





1. A guidance-light display apparatus for mounting on a lead aircraft so as to be visible by a pilot of a trailing aircraft for guiding such pilot in flying the trailing aircraft into a predetermined in-flight link-up position with respect to the lead aircraft, comprising:

sensor means for producing an electrical signal representing the instantaneous position of the trailing aircraft relative to the lead aircraft and associated means responsive to said sensor means for producing an electrical signal representing the relative velocity between the lead and trailing aircraft along a fore-aft axis that is parallel to the longitudinal axis of the lead aircraft;

an array of spaced apart guidance lights arranged on the body of the lead aircraft along a line extending parallel to said longitudinal axis;

light operating means responsive to said associated means for sequentially strobing said lights lengthwise of said array at a strobing frequency that varies as a function of said signal representing said relative velocity.

4,158,886

OPERATOR CONSOLE FOR A REPRODUCTION MACHINE

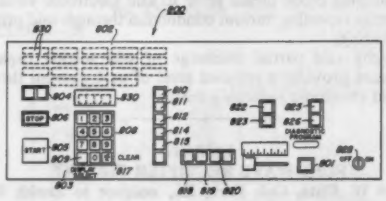
Gerald A. Gray, Jr., Fairport, and Edward L. Steiner, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1977, Ser. No. 829,027
Int. Cl.[2] G06F *9/06, 15/20*
U.S. Cl. 364—518 **5 Claims**

1. In a reproduction machine having machine components including an operator console with a fixed number of input selection devices, said machine including a programmable digital computer being instructed by a plurality of programs, the improvement comprising a method of utilizing the same selection device to initiate different machine activities, said method including:

storing the programs in a memory;

accessing the programs to instruct the computer to control the machine components in particular manner;



sensing the activation of the console selection devices every time a different program is accessed; and

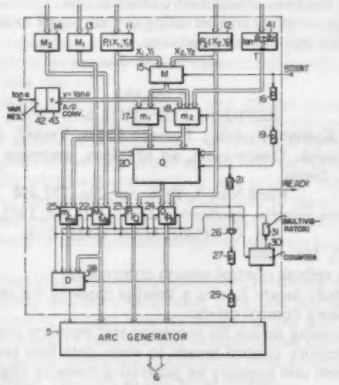
providing a unique output signal in response to the activation of the same devices for initiating different machine activity depending upon which program is currently instructing the computer.

4,158,887

CURVE GENERATOR FOR GENERATING A SMOOTH CURVE WITH A PAIR OF CIRCULAR ARCS BETWEEN TWO GIVEN POINTS

Makoto Kosugi, Higashiyamato, Japan, assignor to Nippon Telegraph and Telephone Public Corp., Tokyo, Japan

Filed Aug. 22, 1977, Ser. No. 826,965
Claims priority, application Japan, Aug. 20, 1976, 51-99254
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—723 **5 Claims**



1. A curve generator for generating a smooth curve with a pair of circular arcs between a start point P_1 and an end point P_2 where the generated curve is tangent to given tangent lines M_1 and M_2 at said points P_1 and P_2, said curve generator comprising selecting means for selecting a point Q which is the

smooth junction point of a pair of arcs on the locus satisfying the formula:

$$\angle P_1QP_2=\pi-\tfrac{1}{2}(\theta_1+\theta_2)$$

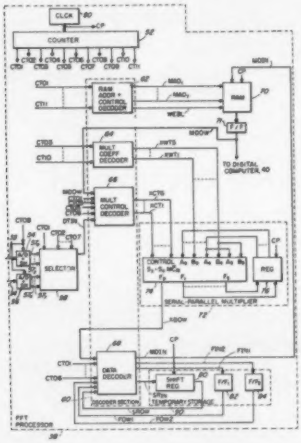
where θ_1 and θ_2 are the angles between the line P_1,P_2 and the tangent lines M_1 and M_2 respectively, decision means for deciding the revolutional direction of said arcs, and generating means coupled to said selecting means and said decision means for generating said two arcs.

4,158,888

FAST FOURIER TRANSFORM PROCESSOR USING SERIAL PROCESSING AND DECODER ARITHMETIC AND CONTROL SECTION

Gerald N. Shapiro, Newton Center; Bertram J. Goldstone, Lexington; Joseph D. Simone, Chelmsford, and Edward E. Spignese, Marblehead, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 721,629, Sep. 1, 1976, Pat. No. 4,075,630.
This application Oct. 14, 1977, Ser. No. 842,205
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—726 **3 Claims**



1. In a signal processor for performing a discrete Fast Fourier Transform on signals applied to such signal processor, such processor including apparatus for repetitively performing the algebraic sum of AW and B, where A is a first portion of such signals, W is a scaling factor and B is a second, later portion of such signals, such apparatus comprising:

(a) means for converting the first portion of such signals, A, into a first series of binary digits;

(b) serial-parallel multiplier means for multiplying the first series of binary digits by a digital word of N bits representative of the scale factor W and fed in parallel to the multiplier means to form the product AW, such product being produced by such multiplier means as a second series of binary digits;

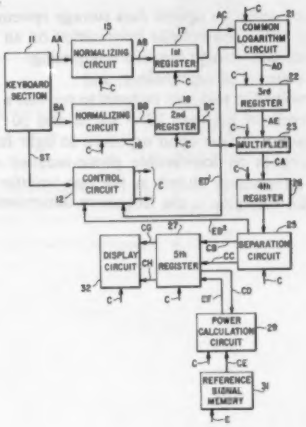
(c) decoder means responsive to a third series of binary digits representative of the second portion of such signals, B, and to the second series of binary digits representative of the product, AW, to form the algebraic sum of AW and B, such sum being produced by such decoder means as a series of binary digits.

4,158,889

CALCULATOR FOR CALCULATING A^X WITH THE BASE A OF ANY POSITIVE NUMBER BY CALCULATING COMMON LOGARITHM OF A

Hiroshi Monden, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 8, 1978, Ser. No. 876,153
Claims priority, application Japan, Feb. 8, 1977, 52-12131
Int. Cl.[2] G06F *7/48*
U.S. Cl. 364—753 **6 Claims**



1. A calculator for calculating an exponential function a^x with the base a in response to a base signal representative of said base and an exponent signal representative of the exponent to produce a result signal representative of said exponential function, where a and x represent a positive and a real number of decimal notation, respectively, said calculator comprising:

first calculation means responsive to said base signal for calculating a common logarithm of said base a to produce a common logarithm signal representative of said common logarithm;

second calculation means responsive to said common logarithm and said exponent signals for multiplying said common logarithm by said exponent to produce a product signal representative of that product of said common logarithm and said exponent which has a characteristic and a mantissa part;

separation means responsive to said product signal for separating said characteristic and said mantissa parts to individually produce a characteristic and a mantissa signal representative of said characteristic and said mantissa parts, respectively;

memory means for memorizing a reference signal representative of a reference value for a calculation of ten to the power of said mantissa part;

third calculation means responsive to said reference and said mantissa signals for calculating ten to the power of said mantissa part to produce a power signal representative of ten to the power of said mantissa part; and

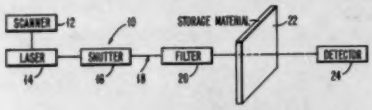
output means for producing said characteristic signal and said power signal in combination as said result signal.

4,158,890

FREQUENCY SELECTIVE OPTICAL DATA STORAGE SYSTEM

Donald M. Burland, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,422
Int. Cl.[2] G11C *13/02, 13/04*
U.S. Cl. 365—119 **1 Claim**



1. A frequency selective optical data storage system having a laser that can write non-volatile information on an organic storage material, said storage material comprising:

a solid host material of naphthalene; and

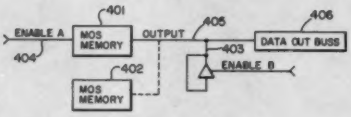
cinnoline dissolved in said host material to provide a concentration therein of between 10^{-2} wt % and 10^{-6} wt % wherein said cinnoline upon exposure to light from said laser undergoes an irreversible photo-induced reaction resulting information stored in the non-volatile ground state of said cinnoline in the frequency dimension.

4,158,891

TRANSPARENT TRI STATE LATCH

Edwin P. Fisher, North Abington, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 605,358, Aug. 18, 1975, abandoned.
This application Aug. 4, 1977, Ser. No. 821,877
Int. Cl.[2] G11C *11/40*; H03K *19/08*
U.S. Cl. 365—222 **6 Claims**



1. In a rectangular array of random access memory chips having tri-state outputs, the combination which comprises plural tri-state amplifiers each having both its input and output connected to a column of said tri-state outputs.

DESIGN PATENTS

GRANTED JUN. 19, 1979

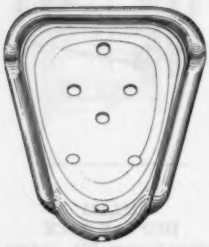
ERRATA

For CLASS	See PATENT NO.
D07-106	252,126
D07-130	252,128
D21-166	252,164
D21-030	252,165
D21-245	252,166
D21-210	252,167
D21-064	252,168
D18-001	252,171
D03-067	252,172
D03-053	252,173
D03-048	252,174
D03-071	252,175

DESIGNS

JUNE 19, 1979

252,116
ATHLETIC CUP
Frank J. DiMatteo, 501 Sunnyfield Dr., Monroeville, Pa. 15146
Filed Dec. 16, 1976, Ser. No. 751,131
Term of patent 14 years
Int. Cl. D2—*01, 02*
U.S. Cl. D2—01

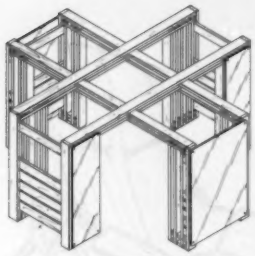


252,117
SHOE SOLE
A. Beverley Lewis, Auburn, Me., assignor to Pickens Footwear Co. Inc., Jasper, Ga.
Filed Aug. 5, 1977, Ser. No. 821,981
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—321

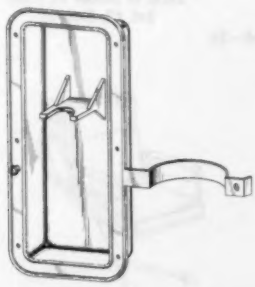
252,118
PORTABLE BABY SEAT OR SIMILAR ARTICLE
Paul K. Meeker, 412 Park Ave., Kent, Ohio 44240
Filed Jul. 5, 1977, Ser. No. 812,746
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—7

252,119
BOAT CHAIR
Eugene M. Kelley, 1796 Larkspur, Pomona, Calif. 91766
Division of Ser. No. 772,661, Feb. 28, 1977. This application Jul. 28, 1978, Ser. No. 929,213
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

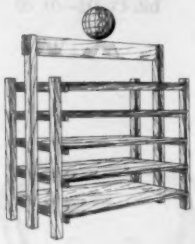
252,120
SUPPORT FOR USE WITH ELECTRONIC COMPUTER UNITS
David A. O'Connor, Virginia Beach, Va., assignor to Virginia Bankshares, Inc.
Division of Ser. No. 669,604, Mar. 23, 1976. This application Feb. 24, 1978, Ser. No. 880,985
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85



252,121
FIRE EXTINGUISHER WALL MOUNTED CABINET
James E. Rutherford, Mendon, Mich., assignor to Plastech Research, Inc., Rush City, Minn.
Filed Sep. 26, 1977, Ser. No. 836,323
Term of patent 14 years
Int. Cl. D29—*01*
U.S. Cl. D6—127



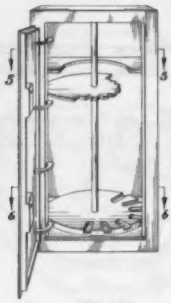
252,122
WINE DISPLAY RACK
William Searcy, Tarpon Springs, Fla., assignor to Tyler Refrigeration Corporation, Niles, Mich.
Filed Aug. 22, 1977, Ser. No. 826,946
Term of patent 3½ years
Int. Cl. D20—*02*
U.S. Cl. D6—153



252,123
DISPLAY RACK
William Searcy, Tarpon Springs, Fla., assignor to Tyler Refrigeration Corporation, Niles, Mich.
Filed Aug. 22, 1977, Ser. No. 826,947
Term of patent 3½ years
Int. Cl. D20—*02*
U.S. Cl. D6—153

252,124
COMBINED MULTIPLE CABINET AND DRAWER STORAGE UNIT
Franz Hero, and Karl Odermatt, both of Hinwiel, Switzerland
Filed Nov. 2, 1976, Ser. No. 738,234
Claims priority, application Fed. Rep. of Germany, May 7, 1976, 877
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—159

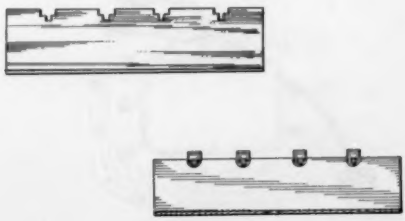
252,125
COMBINED GUN AND ACCESSORY CABINET OR SIMILAR ARTICLE
Ervin C. Oakley; George R. Bell, and William E. Poole, all of Winston Salem, N.C., assignors to ECO Industries, Inc.
Filed May 20, 1977, Ser. No. 798,911
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—167



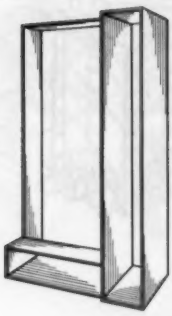
252,126
PASTRY KITCHEN TOOL
Dick H. Durant, 1418 Manzanita St., Los Angeles, Calif. 90027
Filed May 23, 1977, Ser. No. 799,521
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—106

252,127
CABINET FOR A WALL MOUNTED FIRE EXTINGUISHER OR SIMILAR ARTICLE
Roger H. Stewart, 85 Dering Rd., Columbus, Ohio 43207
Filed Jun. 30, 1977, Ser. No. 811,997
Term of patent 14 years
Int. Cl. D29—*01*
U.S. Cl. D6—127

252,128
SHISH KABOB KIT
William F. P. Olson, Salem, Mass., assignor to H. S. Gilman, Inc., Salem, Mass.
Filed Oct. 26, 1976, Ser. No. 735,431
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—130

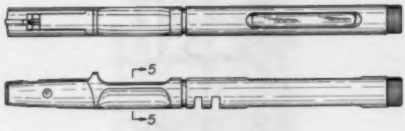


252,129
WALL MOUNTED FRAME FOR A WARDROBE CABINET
Margareta Gavel, and Peter Gavel, both of Stockholm, Sweden, assignors to BPA Byggproduktion AB, Stockholm, Sweden
Filed Apr. 27, 1976, Ser. No. 680,803
Claims priority, application Sweden, Nov. 14, 1975, 02278/75
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

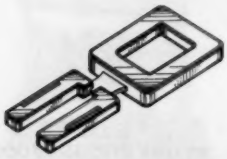


252,130
POWER DRIVEN LAWN TRIMMER
David J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.
Filed Aug. 22, 1977, Ser. No. 826,926
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—8

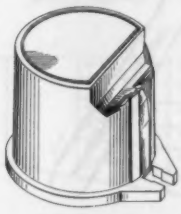
252,131
GLASS CUTTER
Ruediger Einhorn, Katonah; Lee R. Chasen, Port Chester, and Joseph W. Blake, III, South Salen, all of N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.
Filed Mar. 31, 1977, Ser. No. 783,272
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—51



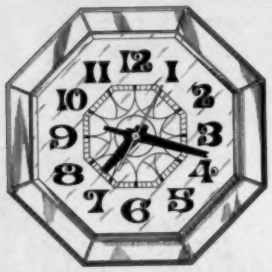
252,132
FASTENER FOR PARCEL STRAPPING
Haruka Fujishiro, Tokyo, Japan, assignor to Nax Co., Ltd., Osaka, Japan
Filed May 16, 1977, Ser. No. 797,641
Claims priority, application Japan, Nov. 18, 1976, 51-45046
Term of patent 14 years
Int. Cl. D08—*08*
U.S. Cl. D8—383



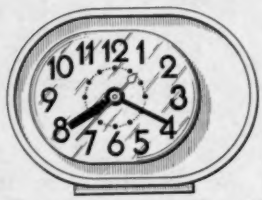
252,133
COMBINED CONTAINER CLOSURE AND ARTICLE HOLDER
Henry Fitzgerald, Westboro, and Michael P. Lucas, Hingham, both of Mass., assignors to The Gillette Company, Boston, Mass.
Filed Jan. 31, 1977, Ser. No. 764,034
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—261



252,134
ELECTRIC CLOCK OR SIMILAR ARTICLE
William J. Cook, Trumbull, Conn., assignor to Timex Corporation, Middleburg, Conn.
Filed Apr. 25, 1977, Ser. No. 790,243
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—21

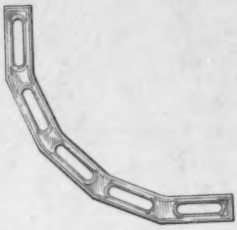


252,135
CLOCK OR SIMILAR ARTICLE
Barbara K. Lewis, Portola Valley, Calif., assignor to General Electric Company
Filed Mar. 11, 1977, Ser. No. 776,888
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—23



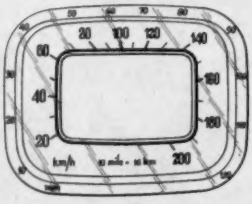
252,136
THERMOCHROMIC WRIST THERMOMETER
Kailash C. Khemka, Indianapolis, Ind., assignor to Bio-Temp Products, Inc., Indianapolis, Ind.
Filed Mar. 16, 1977, Ser. No. 778,058
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

252,137
ELBOW TEMPLATE
David Lane, 13 Towns Rd., Etobicoke, Ontario, Canada
Filed May 17, 1977, Ser. No. 797,773
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64

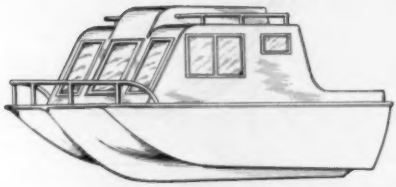


252,138
WRISTWATCH CASE
Tsuyoshi Onodera, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan
Filed Dec. 20, 1976, Ser. No. 752,551
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—30

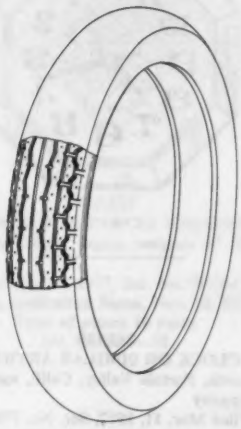
252,139
VEHICLE SPEEDOMETER METRIC CONVERSION LABEL
Harry Chojna, 1 Dallas Ct., Hughesdale, Victoria, Australia
Filed Sep. 15, 1976, Ser. No. 723,437
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—103



252,140
BOAT
Donald A. Pelkey, 42 Temple Dr., Sacramento, Calif. 95827
Filed Feb. 4, 1977, Ser. No. 765,871
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—66

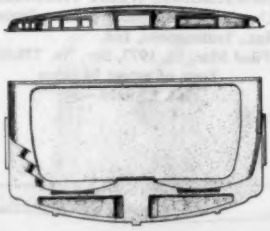


252,142
TIRE
Barrington S. Gill, and Claude A. Hart, both of Sutton Coldfield, England, assignors to Dunlop Limited, England
Filed Sep. 13, 1977, Ser. No. 832,911
Claims priority, application United Kingdom, Mar. 16, 1977, 979290/77
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—141

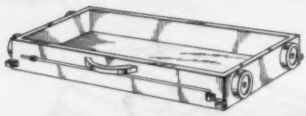


252,141
MOTORCYCLE
Koichiro Matsuoka, Tachikawa, and Tsunemi Kawashima, Tokyo, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha (Yamaha Motor Co., Ltd.), Iwata, Japan
Filed Dec. 16, 1976, Ser. No. 751,329
Claims priority, application Japan, Jun. 16, 1976, 51-23011; Nov. 18, 1976, 51-45324
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110

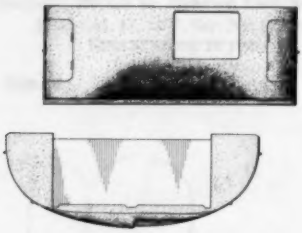
252,143
VEHICLE OVERHEAD CONSOLE
Donald T. Moore, Sr., 1941 Domingo Rd., Fullerton, Calif. 92631, and Donald T. Moore, Jr., 583 Santiago Canyon Way, Brea, Calif. 92621
Filed Feb. 16, 1978, Ser. No. 878,949
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



252,144
MOVABLE TRAY FOR PICK-UP TRUCKS
Vernon M. Carmean, Rte. 3, Box 79, Rich Hill, Mo. 64779
Filed Oct. 11, 1977, Ser. No. 841,137
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

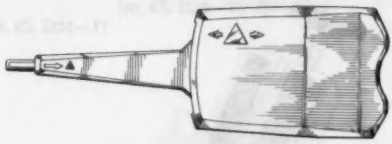


252,145
AIR DEFLECTOR FOR REFRIGERATED VEHICLES
Joseph M. FitzGerald, and James P. FitzGerald, both of Buena Park, Calif., assignors to FitzGerald Corporation, Buena Park, Calif.
Filed Oct. 21, 1977, Ser. No. 844,495
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181

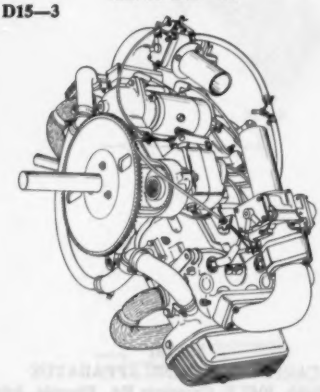


252,146
VEHICLE WHEEL
Philip G. Patch, Mission Viejo, Calif., assignor to Keystone Products, Inc., Ontario, Calif.
Filed Jul. 28, 1978, Ser. No. 929,260
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—206

252,147
AUTOMOTIVE TURN SIGNAL SWITCH
Edward J. Nitsch, Camillus; Alan W. Brownlie, Skaneateles, and Kent S. Jones, Syracuse, all of N.Y., assignors to R. E. Dietz Company, Syracuse, N.Y.
Filed Jul. 25, 1977, Ser. No. 818,972
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—37



252,148
INTERNAL COMBUSTION ENGINE
Buford J. Schramm, 1330 E. Freemont Dr., Tempe, Ariz. 85281, and Robert G. Everts, 2301 W. Colt Rd., Chandler, Ariz. 85224
Filed Sep. 10, 1976, Ser. No. 722,078
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D15—3

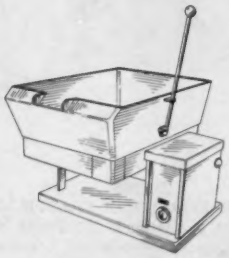


252,149
PUMP
Jose P. Pages, Carretera de Mieras, s.n. Banyoles, Girona, Spain
Filed Oct. 21, 1977, Ser. No. 844,499
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7

252,150
CARPET CLEANING APPARATUS
Charles F. Webb, 3047 E. Greenway Rd., Phoenix, Ariz. 85032
Filed Apr. 1, 1977, Ser. No. 783,808
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—48

252,151
CARPET CLEANING APPARATUS
Charles F. Webb, 3047 E. Greenway Rd., Phoenix, Ariz. 85032
Filed Apr. 11, 1977, Ser. No. 786,604
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—48

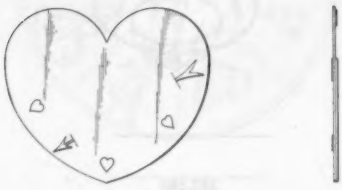
252,152
TILTABLE FRYING PAN STRUCTURE AND SUPPORT THEREFOR
William M. Bardeau, 158 Norfinch Dr., Downsview, Ontario, Canada (M3N 1Y1)
Filed Sep. 20, 1977, Ser. No. 837,749
Claims priority, application Canada, Sep. 15, 1977, 42964
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—104



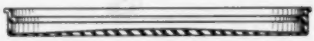
252,153
TYPEWRITER
Robin P. Boot, Birmingham, England, assignor to Dobson Park Industrial Products Ltd.
Filed Mar. 15, 1977, Ser. No. 777,764
Claims priority, application United Kingdom, Sep. 17, 1976, 977216/76
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1

252,154
TYPEWRITER
Robin P. Boot, Birmingham, England, assignor to Dobson Park Industrial Products Ltd.
Filed Mar. 15, 1977, Ser. No. 777,767
Claims priority, application United Kingdom, Sep. 17, 1976, 977217/76
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1

252,155
ENVELOPE
Sam S. Okimoto, 280 Lee St., Oakland, Calif. 94610
Filed Oct. 17, 1977, Ser. No. 843,161
Term of patent 14 years
Int. Cl. D19—*01*
U.S. Cl. D19—4

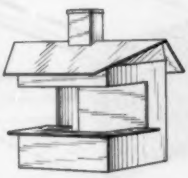


252,156
DIAPHRAGM
Roy A. Tabony, Birmingham, and David Hadfield, Burton-on-Trent, both of England, assignors to Lucas Industries Limited, Birmingham, England
Filed Mar. 15, 1976, Ser. No. 666,685
Claims priority, application United Kingdom, Sep. 18, 1975, 972598/75
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

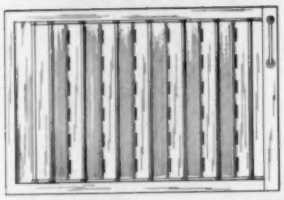


252,157
DIAGNOSTIC DEVICE FOR MEASURING BIOCHEMICAL CHARACTERISTICS OF MICROORGANISMS AND THE LIKE
Donald P. Kronish, Rockaway; William D. Young, Montclair; Walter E. Jacobson, Morris Plains, and Doris B. Taylor, Parsippany, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Apr. 14, 1977, Ser. No. 787,658
Term of patent 14 years
Int. Cl. D24—*02;* D9—*04*
U.S. Cl. D24—17

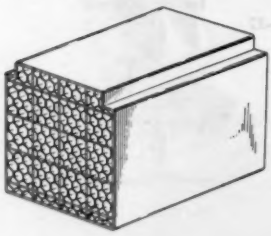
252,158
VENDING STAND OR SIMILAR ARTICLE
Ralph M. DeWeese, 270 Seventh St., Wheeling, Ill. 60090
Filed Jul. 25, 1977, Ser. No. 818,595
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



252,159
SHUTTER
Leo Bernardo, 621 SE. 7th Ave., Pompano Beach, Fla. 33060
Filed Mar. 16, 1977, Ser. No. 778,241
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—47



252,160
COMBINED PLURAL SPACER AND GUIDE INSERT MODULE
Peter J. Thwaites, Eltisley, and Dennis W. Green, Stapleford, both of England, assignors to Dufaulite Developments Limited, Cambridgeshire, England
Filed Feb. 6, 1976, Ser. No. 655,798
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—88



252,161
COSMETIC CONTAINER
Milton O. Flower, Van Nuys, Calif., assignor to Halston Fragrances, Inc.
Filed Aug. 5, 1977, Ser. No. 821,984
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—87

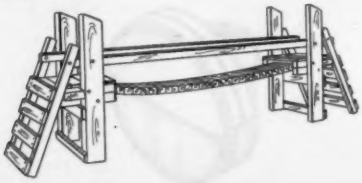
252,162
BIRD FEEDER
Bernard R. Barry, Green Mansion Rd., Warrensberg, N.Y. 12885
Filed Sep. 25, 1978, Ser. No. 945,770
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—14

252,163
BRIDLE BIT
James L. Johnson, Rte. 3, Box 366, Fort Worth, Tex. 76140
Filed Oct. 25, 1977, Ser. No. 845,148
Term of patent 14 years
Int. Cl. D30—*04*
U.S. Cl. D30—21

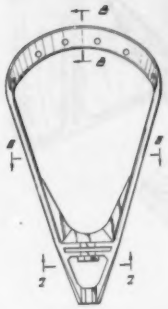
252,164
DOLL
John B. Salt, and David J. Salt, both of 237 Dickenson Rd., Longsight, Manchester, M13 OYW, England
Filed Jan. 11, 1977, Ser. No. 758,412
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—166

252,165
GAME BOARD
Tobin Wolf, 285 Aycrigg Ave., Passaic, N.J. 07055
Filed Mar. 11, 1977, Ser. No. 776,535
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—30

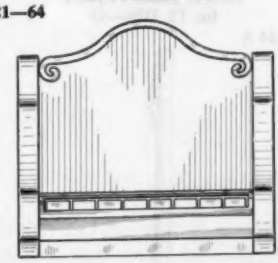
252,166
PLAYGROUND CLIMBER OR THE LIKE
Berthold B. Dieter, and Charles L. Gibson, both of Terre Haute, Ind., assignors to Creative Playgrounds Corporation, Terre Haute, Ind.
Filed Mar. 24, 1977, Ser. No. 780,864
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—245



252,167
LACROSSE STICK HEAD
Carl B. Ahlenfeld, 6010 Westchester Park Dr., College Park, Md. 20740, and James D. Macey, 299 Cedar La., Annapolis, Md. 21403
Filed Sep. 21, 1977, Ser. No. 835,247
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—210



252,168
TOY PIANO
Michael I. Satten, Great Neck Estates, N.Y., assignor to Child Guidance Playthings, Inc., New York, N.Y.
Filed Jan. 27, 1977, Ser. No. 763,040
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—64

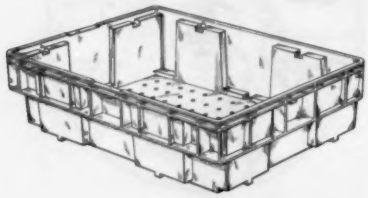


252,169
DESK LAMP
Lorant Lacko, Sr., 10619 W. Exposition, Lakewood, Colo. 80226
Filed Jul. 12, 1977, Ser. No. 814,852
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 C

252,170
POCKET PENLIGHT
Raymond W. Simmons, North Pinellas Park, Fla., assignor to Concept, Inc., Clearwater, Fla.
Filed Oct. 4, 1976, Ser. No. 728,984
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

252,171
TYPEWRITER
Robin P. Boot, Birmingham, England, assignor to Dobson Park Industrial Products Ltd.
Filed Mar. 15, 1977, Ser. No. 777,765
Claims priority, application United Kingdom, Sep. 17, 1976, 977215
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1

252,172
TOTE BOX FOR FRUIT OR THE LIKE
James C. Carroll, Hopkinsville, Ky., and Lewis T. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Dec. 28, 1976, Ser. No. 753,059
Term of patent 14 years
Int. Cl. D87—*99*
U.S. Cl. D3—67



252,173
PURSE
Timmy S. Woods, 1727 Angelo Dr., Beverly Hills, Calif. 90210
Filed Sep. 29, 1977, Ser. No. 837,891
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—53

252,174
SHOULDER POCKETBOOK
Paul A. McArthur, 1798 Waverland Cir., Macon, Ga. 31204
Filed Jan. 20, 1978, Ser. No. 871,154
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—48

252,175
CARRYING CASE
Sol Koffler, Providence, R.I., assignor to American Tourister, Inc.
Continuation-in-part of Ser. No. 711,795, Aug. 5, 1976. This application Jan. 21, 1977, Ser. No. 761,222
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

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TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF JUNE, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See*—
Mitchell, Hal D., 4,158,242, Cl. 2-2.000.

AB Bofors: *See*—
Tidemalm, Gustav H.; and Vidinghoff, Bjorn E., 4,158,324, Cl. 89-41.00H.

AB Kalle-Regulatorer: *See*—
Ingemarsson, Gosta I., 4,158,627, Cl. 210-49.000.

Abbott Laboratories: *See*—
Durrett, Andrew M.; and Pawlak, Kenneth E., 4,158,362, Cl. 128-272.000.

ACF Industries, Incorporated: *See*—
Reedy, Charles E., 4,158,453, Cl. 251-144.000.

Acushnet Company: *See*—
Sullivan, Paul F.; Moore, Randall W.; Hottel, Hoyt C., Jr.; Pelletier, Raymond G.; Gobush, William; and Lynch, Francis deS., 4,158,853, Cl. 358-93.000.

Ad-Tec Products, Inc.: *See*—
Whelan, James P., 4,158,631, Cl. 210-497.00R.

Adamczyk, Danuta: *See*—
Gierek, Adam; Bajka, Lech; and Adamczyk, Danuta, 4,158,710, Cl. 427-310.000.

Adamer, Siegfried: *See*—
Chiovini, Jacky; Marion, Jean-Paul; and Adamer, Siegfried, 4,158,708, Cl. 426-650.000.

Adams, Jim M., to Projects in Health, Inc. Expiratory flow meter. 4,158,360, Cl. 128-725.000.

Air-Vac Engineering Co., Inc.: *See*—
Lasto, Clifford S.; and DuHaime, Raymond A., 4,158,528, Cl. 417-163.000.

Aisan Industry Co., Ltd.: *See*—
Iwata, Minoru; Yasuda, Takeru; and Hagiwara, Shyoichi, 4,158,289, Cl. 60-276.000.

Ajello, Joseph M.: *See*—
United States of America, National Aeronautics and Space Administration; Chutjian, Ara; and Ajello, Joseph M., 4,158,775, Cl. 250-423.00P.

Akai, Shin-ichi; Nishida, Yasuhiro; and Fujita, Keiichiro, to Sumitomo Electric Industries, Ltd. Semi-insulating gallium arsenide single crystal. 4,158,851, Cl. 357-63.000.

AKG Akustische u.Kino-Gerate Gesellschaft m.b.H.: *See*—
Gorike, Rudolf, 4,158,753, Cl. 179-182.00R.

Akimoto, Seiichi; Watanabe, Mitsuhiro; Yoshida, Tomiharu; Sugaya, Zunichi; Saito, Takashi; and Ishii, Yoshimi, to Hitachi, Ltd. Apparatus for handling control rod drives. 4,158,600, Cl. 176-30.000.

Akzona Incorporated: *See*—
Shearer, Jack F., 4,158,473, Cl. 339-31.00R.

Albert P. Marinko: *See*—
Ligeti, Enrique, 4,158,364, Cl. 131-187.000.

Alcott, David K., to Haulamatic Corporation. Power hoist. 4,158,797, Cl. 318-371.000.

Aldrich, Billy R.; and Whitt, William D., to United States of America, National Aeronautics and Space Administration. General purpose rocket furnace. 4,158,742, Cl. 13-20.000.

ALKEM GmbH: *See*—
Funke, Peter, 4,158,681, Cl. 264-0.500.

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Allan, John L. H.: *See*—
Readio, Philip D.; and Allan, John L. H., 4,158,592, Cl. 156-666.000.

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Allen-Bradley Company: *See*—
Reichert, Gilbert A.; and Trendel, Dennis J., 4,158,757, Cl. 200-302.000.
Wielebski, Wayne H.; and Radtke, Joseph D., 4,158,836, Cl. 340-309.100.

Aluminum Company of America: *See*—
LaBar, Richard G., 4,158,568, Cl. 106-64.000.

AM International, Inc.: *See*—
Cieplik, Ronald J., 4,158,496, Cl. 354-319.000.
Seelenbinder, Terry G.; Hudson, Walter A.; and Oddo, Eugene P., 4,158,495, Cl. 354-318.000.

Amariti, Luigi; Juskey, John S.; Azari, Shapoor; and Kucera, Thomas J., to Apeco Corporation. Particles of thermoplastic polymer, and process of making the same. 4,158,634, Cl. 252-62.10P.

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Botros, Raouf, 4,158,542, Cl. 8-42.00D.

American Cyanamid Company: *See*—
Wang, Samuel S.; and Huliganga, Ernie F., 4,158,623, Cl. 209-166.000.

American Optical Corporation: *See*—
Dianetti, Joseph C.; and Rybicki, Edward B., 4,158,475, Cl. 350-50.000.
Naylor, Thomas K., 4,158,863, Cl. 361-56.000.

AMF Incorporated: *See*—
Thomas, George A.; and Splittstoesser, Clair D., 4,158,280, Cl. 56-202.000.

AMP Incorporated: *See*—
Berger, John G., 4,158,803, Cl. 323-21.000.
Keller, Joseph R., 4,158,745, Cl. 174-52.0FP.
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Anderson, Ivan R.: *See*—
McKinley, Frederick C.; and Anderson, Ivan R., 4,158,884, Cl. 364-431.000.

Anderson, Robert W.; and Kannenberg, Bob G., to Western Company of North America, The. Method of stabilizing clay formations. 4,158,521, Cl. 405-264.000.

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Navi, Menashe, 4,158,333, Cl. 101-363.000.

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Elsner, Hans J.; Antol, Ronald F.; and Castner, Raymond P., 4,158,309, Cl. 73-641.000.

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Amariti, Luigi; Juskey, John S.; Azari, Shapoor; and Kucera, Thomas J., 4,158,634, Cl. 252-62.10P.

Arai, Tohru: *See*—
Komatsu, Noboru; and Arai, Tohru, 4,158,578, Cl. 148-6.110.

Archer, John D.: *See*—
Phillips, Michael J.; and Archer, John D., 4,158,477, Cl. 350-96.210.

Archer, William E., to Joy Manufacturing Company. Gas cleansing means. 4,158,702, Cl. 423-210.000.

Ardis, Alan E.: *See*—
Gavin, David F.; Ardis, Alan E.; Katz, Lawrence E.; and Schellberg, John D., 4,158,660, Cl. 260-308.00B.

Arends, Albert W.; Pickard, George L.; West, G. Allan; and Russell, Edward J., to Leesona Corporation. Thermoforming machine with variable mold closed cycle. 4,158,539, Cl. 425-451.400.

Armstrong Cork Company: *See*—
Gard, George E.; Manning, Elvin K.; Rueggeberg, Werner; and Weinhold, Kerry L., 4,158,778, Cl. 250-461.00R.

Artos Dr.-Ing. Meier-Windhorst KG (GmbH & Co.): *See*—
Bahre, Gerhard W., 4,158,298, Cl. 68-43.000.

Asano, Isamu: *See*—
Yasuhara, Takeshi; Tamai, Mitsuru; Yuhara, Tadanori; and Asano, Isamu, 4,158,311, Cl. 73-718.000.

Ashland Oil, Inc.: *See*—
Michelson, Anatol, 4,158,381, Cl. 164-226.000.

Atlantic Richfield Company: *See*—
Avery, James E.; and Gay, Charles F., 4,158,591, Cl. 156-643.000.
Beck, Steven R., 4,158,620, Cl. 208-11.00R.
Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., 4,158,548, Cl. 44-1.00R.

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Kimber, Erich V.; and Ronne, Per-Axel C., 4,158,393, Cl. 173-2.000.
Prebensen, Soren P., 4,158,520, Cl. 405-260.000.

Auer, Werner, to Teldix GmbH. Gyro compass and directional gyro arrangement. 4,158,261, Cl. 33-324.000.

Autoclave Engineers, Inc.: *See*—
Berty, Jozsef M., 4,158,639, Cl. 252-301.10W.

Automatic Radio Mfg. Co., Inc.: *See—*
DeYoreo, Sal G., 4,158,268, Cl. 43-112.000.

Automation Industries, Inc.: *See—*
Sharpe, Donald E.; and Van Valkenburg, Howard E., 4,158,308, Cl. 73-609.000.

Auwarter, Wilhelm: *See—*
Fenner, Hans; Auwarter, Wilhelm; and Stark, Karl-Heinz, 4,158,465, Cl. 296-193.000.

Avco Corporation: *See—*
Clemens, John E.; Stephens, Thomas C.; Dilz, Albert E.; and Hewlett, James A., 4,158,842, Cl. 343-7.0PF.
Long, James R., 4,158,767, Cl. 235-92.0PE.

Avery, James E.; and Gay, Charles F., to Atlantic Richfield Company. Solar cell manufacture. 4,158,591, Cl. 156-643.000.

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Amariti, Luigi; Juskey, John S.; Azari, Shapoor; and Kucera, Thomas J., 4,158,634, Cl. 252-62.10P.

Azorlosa, Julian L., to GAF Corporation. Multifunctional acrylate n-vinylamide anaerobic adhesive compositions. 4,158,647, Cl. 260-13.000.

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Magistro, Angelo J., 4,158,645, Cl. 252-462.000.

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Larson, Gordon C., 4,158,370, Cl. 138-89.000.
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Baer, Ronald W.; and Goldberg, Marvin E., to Revlon Inc. Process and composition for permanent waving. 4,158,704, Cl. 424-72.000.

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Bahre, Gerhard W., to Artos Dr.-Ing. Meier-Windhorst KG (GmbH & Co.). Device for continuous wet treatment of textile webs. 4,158,298, Cl. 68-43.000.

Bahry, Abraham; and Dolev, Moshe. Safe. 4,158,337. Cl. 109-59.00R.

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Bajka, Lech: *See—*
Gierek, Adam; Bajka, Lech; and Adamczyk, Danuta, 4,158,710, Cl. 427-310.000.

Baker, Richard H., to Exxon Research & Engineering Co. Protection circuit for transistorized switch. 4,158,866, Cl. 361-86.000.

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Ballato, Arthur D., to United States of America, Army. Method and apparatus for testing crystal elements. 4,158,805, Cl. 324-56.000.

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Barrett, Harrison H.: *See—*
Davis, Luther, Jr.; and Barrett, Harrison H., 4,158,770, Cl. 250-272.000.

Barry, John, to Hawkes, William S. Door closure. 4,158,271, Cl. 49-386.000.

Bartsch, Raymond C., to National Distillers and Chemical Corp. Vinyl acetate preparation. 4,158,737, Cl. 560-245.000.

BASF Aktiengesellschaft: *See—*
Stubenrauch, Gerd; Hamprecht, Gerhard; Wuerzer, Bruno; and Retzlaff, Guenter, 4,158,559, Cl. 71-91.000.

Bass, Melvin L.; and Buford, Wesley E. Vehicle safety wheel. 4,158,468, Cl. 301-39.00T.

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Baumann, Marcus: *See—*
Baumann, Niklaus; Zweifel, Hans; Baumann, Marcus; and Waterhouse, John S., 4,158,730, Cl. 528-273.000.
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Kleiner, Frank; and Muller, Karl H., 4,158,538, Cl. 425-445.000.

Beardmore, John M., to General Motors Corporation. Piston with variable side clearance. 4,158,328, Cl. 92-212.000.

Beck, Steven R., to Atlantic Richfield Company. Retorting oil shale with iron oxide impregnated porous pellets. 4,158,620, Cl. 208-11.00R.

Becker, Henry E.; McConnell, Albert L.; and Schutte, Richard W., to Scott Paper Company. Bonded, differentially creped, fibrous webs and method and apparatus for making same. 4,158,594, Cl. 162-112.000.

Beckman Instruments, Inc.: *See—*
Dellamano, Harry A., 4,158,809, Cl. 324-99.00D.
Louderback, Allan L., 4,158,544, Cl. 23-230.00B.
Polito, Alan J., 4,158,703, Cl. 424-1.000.

Beckmann, Franz: *See—*
Weber, Heinrich; Dungs, Horst; Urbye, Klaus; Beckmann, Franz; Schmauch, Hugo; and Flasche, Karl H., 4,158,550, Cl. 44-13.000.

Beeck, Udo; and Kluge, Andreas, to Leybold-Heraeus GmbH & Co. KG. Ion filter and method of making the same. 4,158,771, Cl. 250-294.000.

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Sawyer, Harold T., 4,158,629, Cl. 210-137.000.

Belanger, Bernard C. Pocket press wheel. 4,158,392, Cl. 172-548.000.

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Belcastro, Rosario, deceased; and Belcastro, Patricia, administratrix, 4,158,335, Cl. 108-64.000.

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Andersen, John N.; and Bell, Norman, 4,158,701, Cl. 423-119.000.

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Daniele, Phillip P., 4,158,755, Cl. 179-99.00H.
Guenther, Robert P.; and Zucker, Melvin S., deceased, 4,158,825, Cl. 333-257.000.

Beloit Corporation: *See—*
Justus, Edgar J., 4,158,596, Cl. 162-213.000.

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Jahelka, James R.; and Bemis, Edward D., 4,158,800, Cl. 318-685.000.

Bendix Corporation, The: *See—*
Blatter, Albert, 4,158,352, Cl. 123-119.0DB.
Koenig, James P., 4,158,470, Cl. 303-71.000.
Kuchy, Ray W., 4,158,843, Cl. 343-113.00R.

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Benkowski, William J.; Fishel, Richard L.; and Maurer, Francis J., to General Tire & Rubber Company, The. Method for reprocessing scrap from fabric reinforced thermoplastic sheet. 4,158,646, Cl. 260-2.300.

Bergen Expo Systems, Inc.: *See—*
Demick, Eugene; and Van Haasteren, Adrian J., Jr., 4,158,491, Cl. 353-90.000.

Berger, David J.: *See—*
Krempp, Stanley G.; and Berger, David J., 4,158,277, Cl. 52-476.000.

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Berger, John G., to AMP Incorporated. Switching high voltage power supply. 4,158,803, Cl. 323-21.000.

Bergstrom, Rolf, to Bulten-Kanthal AB. Revolving chain links. 4,158,288, Cl. 59-1.000.

Bernstein, Robert E. Pumping apparatus comprising two collapsible chambers. 4,158,530, Cl. 417-389.000.

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Cooper, Frank W., Jr.; Silverblatt, Bernard L.; Knight, Charles B.; and Berringer, Robert T., 4,158,605, Cl. 176-61.000.

Berty, Jozsef M., to Autoclave Engineers, Inc. Method of storing gases. 4,158,639, Cl. 252-301.10W.

Bethlehem Steel Corporation: *See—*
Bauer, Edmund G.; and Shadle, Glenn E., 4,158,610, Cl. 201-1.000.

Betz Laboratories, Inc.: *See—*
Mattioli, Terrence W.; and Williams, Glenn D., 4,158,562, Cl. 75-41.000.

Beyl, Jean J. A. Captive screw device. 4,158,377, Cl. 151-69.000.

Bhatti, Nazir A.: *See—*
Klawitter, Jerome J.; and Bhatti, Nazir A., 4,158,684, Cl. 264-43.000.

Bicron Corporation: *See—*
Novak, William P., 4,158,773, Cl. 250-361.00R.

Biller, Bruce A.; and Scherer, Henry W., to S & C Electric Company. Fitting for a circuit-interrupting device. 4,158,830, Cl. 337-171.000.

Biolik, Felicjan; Gurgul, Franciszek; Odrobina, Stanislaw; Morys, Zygmunt; Wieczorek, Alfons; Wydmanski, Zenon; and Gawlowski, Piotr, to Biuro Projektow Pyrzemyslu Metali Niezelaznych "Bipromet". Electric resistance furnace. 4,158,743, Cl. 13-25.000.

Birnkraut, Hans-Walter; and Kluy, Werner, to Ruhrchemie Aktiengesellschaft. Copolymers of ethylene, process for producing them and their use. 4,158,588, Cl. 156-331.000.

Bischoff, Dennis E.; Dickinson, Gary R.; Hinshaw, Michael E.; and Brooker, Robert M., to Dow Chemical Company, The. Automated apparatus for testing sustained release drugs. 4,158,694, Cl. 422-81.000.

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Biolik, Felicjan; Gurgul, Franciszek; Odrobina, Stanislaw; Morys, Zygmunt; Wieczorek, Alfons; Wydmanski, Zenon; and Gawlowski, Piotr, 4,158,743, Cl. 13-25.000.

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Witten, John E.; Wood, Loren E.; and Short, Edward H., III, 4,158,422, Cl. 220-89.00A.

Blackburn, John B.; Irvine, Alexander M.; Sutcliffe, Michael; and McLaren, George, to Ciba-Geigy Corporation. Process of producing a phthalocyanine pigment. 4,158,572, Cl. 106-288.00Q.

Blake, Arthur T. Self-locking core chucks. 4,158,446, Cl. 242-68.200.

Blaskowski, Henry J.; and Mehta, Arun K., to Combustion Engineering, Inc. Entrained flow coal gasifier. 4,158,552, Cl. 48-210.000.

Blatter, Albert, to Bendix Corporation, The. Apparatus for providing additional air to aid starting of I.C. engines. 4,158,352, Cl. 123-119.0DB.

Blockley, Alec G.; and McConnell, Edmund A., to Wickman Machine Tool Sales Limited. Controls for multi-spindle lathes. 4,158,319, Cl. 82-3.000.

Bloom, Everett E.; Stiegler, James O.; Rowcliffe, Arthur F.; and Leitnaker, James M., to United States of America, Energy. Austenitic stainless steel alloys having improved resistance to fast neutron-induced swelling. 4,158,606, Cl. 176-87.000.

Bode, Harald E. W. Analog speech encoder and decoder. 4,158,751, Cl. 179-1.0SA.

Boeckmann, Alfred. Method of making a solar energy collector. 4,158,686, Cl. 264-45.700.

Boeing Company, The: *See*—
Neuberger, Wayne K., 4,158,885, Cl. 364-460.000.
Pinson, George T., 4,158,845, Cl. 343-759.000.

Boise Cascade Corporation: *See*—
Novatny, Donald F., 4,158,410, Cl. 206-527.000.

Bosch, Paul: *See*—
Nonnemacher, Gerhard; Knodel, Emil; and Bosch, Paul, 4,158,529, Cl. 417-216.000.

Bose Corporation: *See*—
Keezer, William J., 4,158,756, Cl. 179-115.50R.

Botros, Raouf, to American Color & Chemical Corporation. Acyldihydroxybenzene azo dyes for metallized polyolefins. 4,158,542, Cl. 8-42.00D.

Bouvier, Pierre M., Executor: *See*—
Dazord, Jacques L.; Mongeot, Henri M.; Guillevic, Gildas J.; and Cueilleron, Jean F., deceased, 4,158,673, Cl. 260-606.50B.

Bowen, Robert F.; and Derby, Palmer P., to Raytheon Company. Utensil handle for use in microwaves. 4,158,464, Cl. 294-31.200.

Bowen, Robert F.; Freedman, George; Teich, Wesley W.; Martel, Thomas J.; and Eves, E. Eugene, II, to Raytheon Company. Seed heating microwave appliance. 4,158,760, Cl. 219-10.55E.

BP Chemicals Limited: *See*—
Cooke, Maurice D., 4,158,611, Cl. 203-28.000.

Brace, Neal O.: *See*—
Dear, Robert E. A.; and Brace, Neal O., 4,158,672, Cl. 260-584.00R.

Brady, Donnie G., to Phillips Petroleum Company. Monohaloalkenyl benzoates and trihaloalkyl benzoates. 4,158,655, Cl. 260-45.75B.

Brainard, Edward C., II, to Environmental Devices Corporation. Wave direction measurement and recording. 4,158,306, Cl. 73-170.00A.

Brandenstein, Manfred: *See*—
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,158,394, Cl. 175-228.000.

Brandt, Donald H.: *See*—
Stirrat, William M.; and Brandt, Donald H., 4,158,323, Cl. 89-1.50R.

Bratkowski, Walter V.; and Grunert, Kurt A., to Westinghouse Electric Corp. Current limiting contactor. 4,158,827, Cl. 335-16.000.

Braun Aktiengesellschaft: *See*—
Hoffmann, Gunter; and Ramspeck, Klaus, 4,158,459, Cl. 274-23.00R.

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Hentschel, Volkmar; and Warner, Gustav, 4,158,573, Cl. 127-19.000.

Brautigam, Robert F. Heat storage system. 4,158,384, Cl. 165-32.000.

Breckenridge, Lloyd L.: *See*—
Smith, Fritz A.; Breckenridge, Lloyd L.; and Schwartz, Albert B., 4,158,676, Cl. 585-481.000.

Brescia, Anthony J.; Fecca, Edward G.; Wenczl, Stephen; and Schriever, Theodore W., to Dart Industries Inc. Knock down shelving system with corner clipped connectors. 4,158,336, Cl. 108-111.000.

Bresman, Joseph M., to United Technologies Corporation. Improved laser gain tube. 4,158,821, Cl. 331-94.50D.

Brichta, Corrado; Tettamanzi, Natale; and Rial, Elio, to Vitrofil S.p.A. Process for imparting a better adhesion between reinforcing materials and plastic matrix and product thereby produced. 4,158,714, Cl. 428-391.000.

Bridgestone Tire Company Limited: *See*—
Matsumoto, Masayasu; Iida, Kazuyoshi; Kondo, Yoshikazu; Mizuno, Keiichiro; Nomoto, Sadao; Murayama, Noriaki; Watanabe, Kei; and Katayama, Tomonori, 4,158,401, Cl. 181-210.000.

Briggs, Rebecca R. M. Collapsible-portable toothbrush holder. 4,158,413, Cl. 211-65.000.

Brooker, Robert M.: *See*—
Bischoff, Dennis E.; Dickinson, Gary R.; Hinshaw, Michael E.; and Brooker, Robert M., 4,158,694, Cl. 422-81.000.

Broome, Jack, to Crompton & Knowles Corporation. Tenter clip. 4,158,252, Cl. 26-93.000.

Brothers, Jack A.; Doman, Robert C.; and McNally, Robert N., to Corning Glass Works. Fused refractory. 4,158,569, Cl. 106-66.000.

Broussely, Michel: *See*—
Gabano, Jean-Paul; and Broussely, Michel, 4,158,723, Cl. 429-197.000.

Brower, Loyd R., Jr.; Madsen, Leonard P.; and Zutaut, Chesley L., to Standard T Chemical Company, Inc. Method and apparatus for removing excess electro-phoretic material from a coated interior workpiece surface. 4,158,619, Cl. 204-181.00R.

Brown, George J., to Christopher Scientific Company. Weighing device using a resonant mass-spring system. 4,158,395, Cl. 177-210.0FP.

Brown, Spencer. Wall panel installation jig. 4,158,455, Cl. 269-102.000.

Buford, Wesley E.: *See*—
Bass, Melvin L.; and Buford, Wesley E., 4,158,468, Cl. 301-39.00T.

Bulten-Kanthal AB: *See*—
Bergstrom, Rolf, 4,158,288, Cl. 59-1.000.

Bundy, Richard P.; Zumsteg, D. Bruce; and Rheinfrank, Lamson, Jr., to Standard Havens, Inc. Apparatus for filtering particulate-laden gases. 4,158,554, Cl. 55-379.000.

Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., to Atlantic Richfield Company. Process for removing sulfur from coal. 4,158,548, Cl. 44-1.00R.

Burkett, Jerry D., to EcoLaire Incorporated. Adjustable speed drive system for centrifugal fan. 4,158,527, Cl. 417-18.000.

Burland, Donald M., to International Business Machines Corporation. Frequency selective optical data storage system. 4,158,890, Cl. 365-119.000.

Burroughs Corporation: *See*—
Sogo, Marilyn R., 4,158,613, Cl. 204-15.000.

Butler, Walter J.; and Eichelberger, Charles W., to General Electric Company. MOSFET Reference voltage circuit. 4,158,804, Cl. 323-22.00R.

Butz, Erich, to Koelsch-Foelger-Werke AK. Treating surfaces with liquids. 4,158,576, Cl. 134-7.000.

C.P.P.L., Inc.: *See*—
Ellsberg, Thomas R., 4,158,874, Cl. 361-172.000.

Calgon Corporation: *See*—
Sinha, Rabindra K., 4,158,643, Cl. 252-447.000.

Campbell, James B.: *See*—
Smith, Edgar C.; and Campbell, James B., 4,158,501, Cl. 355-77.000.

Campbell, Willis R.; and Freimuth, John H., to Sperry Rand Corporation. Center pivot dispensing apparatus. 4,158,331, Cl. 100-5.000.

Canadian Patents and Development Limited: *See*—
Jones, John D.; and Holme, John, 4,158,656, Cl. 260-123.500.
Meadus, Frederick W.; Puddington, Ira E.; and Sparks, Bryan D., 4,158,648, Cl. 260-15.000.
Wan, Jeffrey K. S., 4,158,822, Cl. 331-94.50L.

Canon Kabushiki Kaisha: *See*—
Hattori, Hiroyuki; Ogawa, Hiroshi; Kishi, Hirotoshi; Umezawa, Kazumi; and Sagara, Seiji, 4,158,499, Cl. 355-8.000.

Cappel, Bert; and Dorn, Alfred, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Screwing tool for printing presses. 4,158,799, Cl. 318-626.000.

Carden, Peter O., to Energy Research Foundation, The. Solar energy collection system. 4,158,354, Cl. 126-270.000.

Cardinale, Raffaele; and Kuchler, Jakob. Insulating glass pane assembly. 4,158,278, Cl. 52-790.000.

Carl Dan. Peddinghaus KG: *See*—
Wittenstein, Horst, 4,158,761, Cl. 219-69.00R.

Carl Pedro and Sons, Inc.: *See*—
Pedro, Alfred J., 4,158,876, Cl. 361-415.000.

Carl Still, Firma: *See*—
Weber, Heinrich; Dungs, Horst; Urbye, Klaus; Beckmann, Franz; Schmauch, Hugo; and Flasche, Karl H., 4,158,550, Cl. 44-13.000.

Carmack, Martha. Rubbish bin lid. 4,158,424, Cl. 220-343.000.

Carpenter Technology Corporation: *See*—
Frantz, Earl L., 4,158,719, Cl. 428-567.000.

Carrier Corporation: *See*—
Sibley, Howard W., 4,158,295, Cl. 62-476.000.

Cassella Aktiengesellschaft: *See*—
Muller, Rolf; Ribka, Joachim; and Tappe, Horst, 4,158,670, Cl. 260-456.00A.

Castner, Raymond P.: *See*—
Elsner, Hans J.; Antol, Ronald F.; and Castner, Raymond P., 4,158,309, Cl. 73-641.000.

Caterpillar Tractor Co.: *See*—
Bagby, Thomas L.; Demeny, Gary L.; and Smead, Robert G., 4,158,344, Cl. 118-630.000.
Shipley, William W., 4,158,305, Cl. 73-119.00A.

Cavitron Corporation: *See*—
Clarke, Robert A.; Kuhl, Peter J.; and Paschke, Richard H., 4,158,584, Cl. 156-73.100.

Cavitt, Roy L.: *See*—
Miller, Richard G.; and Cavitt, Roy L., 4,158,716, Cl. 428-427.000.
Ceramicoli, John. Testing of fluidic devices. 4,158,304, Cl. 73-49.800.
Chammas, Edmond D.; and Lewis, Edwin C., II, to Weatherford/DMC, Inc. Chemical cutting apparatus and method for use in wells. 4,158,389, Cl. 166-297.000.
Champion International Corporation: *See*—
Wysocki, Lawrence, 4,158,412, Cl. 206-612.000.
Chapman, Francis E., to S. C. Johnson & Son, Inc. Non-scratching liquid scouring cleanser using abrasives with a Mohs hardness of greater than 3. 4,158,553, Cl. 51-304.000.
Chart, John E.: *See*—
Luch, Daniel; and Chart, John E., 4,158,612, Cl. 204-12.000.
Chellis, Fred F., to Cryogenic Technology, Inc. Refrigeration system with magnetic linkage. 4,158,293, Cl. 62-6.000.
Cherbourg, Robert; Falluel, Jean-Pierre; and Menard, Michel, to Regie Nationale des Usines Renault. Device for driving sliding windows. 4,158,270, Cl. 49-103.000.
Chevron Research Company: *See*—
Cleveland, James D.; and Edwards, Laroy H., 4,158,732, Cl. 544-8.000.
Chi, Hsu T. Foldable packing case. 4,158,421, Cl. 220-6.000.
Chiba, Seibi: *See*—
Sakoe, Hiroaki; and Chiba, Seibi, 4,158,750, Cl. 179-1.0SD.
Chiba, Tsuneyo: *See*—
Kadono, Shinji; Chiba, Tsuneyo; and Umezawa, Kiyoshi, 4,158,883, Cl. 364-200.000.
Chicoine, Gustave J. Manual downshift deacceleration warning light system. 4,158,833, Cl. 340-72.000.
Chiovini, Jacky; Marion, Jean-Paul; and Adamer, Siegfried, to Societe d'Assistance Technique pour Produits Nestle S.A. Spice extract. 4,158,708, Cl. 426-650.000.
Christopher Scientific Company: *See*—
Brown, George J., 4,158,395, Cl. 177-210.0FP.
Chung, Chan I., to Exxon Research & Engineering Co. Elastomer blend composition of a sulfonated EPDM terpolymer and a polystyrene resin. 4,158,653, Cl. 260-33.6AQ.
Chutjian, Ara: *See*—
United States of America, National Aeronautics and Space Administration; Chutjian, Ara; and Ajello, Joseph M., 4,158,775, Cl. 250-423.00P.
Ciba-Geigy Corporation: *See*—
Babler, Fridolin, 4,158,661, Cl. 260-325.0PH.
Baumann, Niklaus; Zweifel, Hans; Baumann, Marcus; and Waterhouse, John S., 4,158,730, Cl. 528-273.000.
Baumann, Niklaus; Zweifel, Hans; Baumann, Marcus; and Waterhouse, John S., 4,158,731, Cl. 528-322.000.
Blackburn, John B.; Irvine, Alexander M.; Sutcliffe, Michael; and McLaren, George, 4,158,572, Cl. 106-288.00Q.
Darms, Roland; and Meindl, Hubert, 4,158,662, Cl. 260-326.00N.
Dear, Robert E. A.; and Brace, Neal O., 4,158,672, Cl. 260-584.00R.
Illy, Hugo; and Fussenegger, Werner, 4,158,724, Cl. 521-90.000.
Wirth, Hermann O.; and Wehner, Hermann W., 4,158,669, Cl. 260-429.700.
Cieplik, Ronald J., to AM International, Inc. Dry silver processor for phototypesetters. 4,158,496, Cl. 354-319.000.
Citizen Watch Company Limited: *See*—
Nakajima, Fumio; Machida, Takayasu; and Yamada, Kenji, 4,158,287, Cl. 58-23.0BA.
Citta, Richard W., to Zenith Radio Corporation. Full-wave rectifier circuit. 4,158,882, Cl. 363-127.000.
Ciuffetti, Salvatore D., to Product Development Associates. Measuring dispenser. 4,158,374, Cl. 141-392.000.
Clark, Arthur E., to United States of America, Navy. Magnetostrictive transducer. 4,158,368, Cl. 137-487.500.
Clarke, Robert A.; Kuhl, Peter J.; and Paschke, Richard H., to Cavitron Corporation. Ultrasonic method for manufacturing brassiere tapes. 4,158,584, Cl. 156-73.100.
Cleamax Limited: *See*—
Jackson, John M., 4,158,405, Cl. 198-480.000.
Clean Energy Corporation: *See*—
Cramer, Frank B., 4,158,697, Cl. 422-189.000.
Clemens, John E.; Stephens, Thomas C.; Dilz, Albert E.; and Hewlett, James A., to Avco Corporation. Radar type fuzes. 4,158,842, Cl. 343-7.0PF.
Clements, Boyd D., to Outboard Marine Corporation. Soil aerating device. 4,158,391, Cl. 172-22.000.
Cleveland, James D.; and Edwards, Laroy H., to Chevron Research Company. Process for production of 2-substituted-imino-3-alkyl-tetrahydro-6H-1,3,4-thiadiazin-5-ones. 4,158,732, Cl. 544-8.000.
Cogas Development Company: *See*—
Schwarzenbek, Eugene F., 4,158,622, Cl. 208-177.000.
Coherent, Inc.: *See*—
Saunders, Richard J., 4,158,762, Cl. 219-121.00L.
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Schaar, Charles H., 4,158,363, Cl. 128-287.000.
Collender, Robert B. Stereoscopic real image scanning reproduction method and apparatus. 4,158,487, Cl. 352-38.000.
Collett, Edward, to United States of America, Army. Automatic determination of the polarization state of nanosecond laser pulses. 4,158,506, Cl. 356-365.000.
Combustion Engineering, Inc.: *See*—
Blaskowski, Henry J.; and Mehta, Arun K., 4,158,552, Cl. 48-210.000.
Commonwealth Scientific and Industrial Research Organization: *See*—
Sullivan, John V., 4,158,790, Cl. 313-231.600.
Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines: *See*—
Foglia, Vincent F. P., 4,158,517, Cl. 405-202.000.
Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris": *See*—
Noblanc, Alain G. N.; and Valenchon, Claude P., 4,158,516, Cl. 405-196.000.
Congleton, David B.: *See*—
Smith, Michael R.; Congleton, David B.; and Diamond, Arthur S., 4,158,715, Cl. 428-412.000.
Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, to Warner-Lambert Company. Process for the production of 2-substituted chromones. 4,158,663, Cl. 260-345.200.
Consiglio, Peter: *See*—
Wiland, Lawrence; Humphrey, Robert; and Consiglio, Peter, 4,158,256, Cl. 32-12.000.
Container Cargo Carriers Corporation: *See*—
Podesta, Sergio, 4,158,416, Cl. 414-139.000.
Container Corporation of America: *See*—
Starr, Anthony J., 4,158,423, Cl. 220-320.000.
Cook, Kenneth J.: *See*—
Massa, Richard L.; Murray, Robert C.; and Cook, Kenneth J., 4,158,808, Cl. 324-74.000.
Cook, Reginald K.; and George, Brian V., to Nuclear Power Company (Whetstone) Limited. Boiler systems for nuclear powered reactors. 4,158,604, Cl. 176-60.000.
Cooke, Maurice D., to BP Chemicals Limited. Process for recovering crude phenol from catalyst-free cumene hydroperoxide cleavage reaction products. 4,158,611, Cl. 203-28.000.
Cooley, Denton A.: *See*—
Reed, Charles C.; Cooley, Denton A.; and Sharp, Russell G., 4,158,693, Cl. 422-46.000.
Cooper, Frank W., Jr.; Silverblatt, Bernard L.; Knight, Charles B.; and Berringer, Robert T., to Westinghouse Electric Corp. Nuclear core baffling apparatus. 4,158,605, Cl. 176-61.000.
Coral, Nevio, to Coral S.A.S. di Nevio Coral. Localized suction device with a sucking inlet head carried by a tubular duct end orientable in space. 4,158,462, Cl. 285-168.000.
Coral S.A.S. di Nevio Coral: *See*—
Coral, Nevio, 4,158,462, Cl. 285-168.000.
Cornell, Charles R., to Eaton Corporation. Electro-hydraulic controller. 4,158,290, Cl. 60-445.000.
Corning Glass Works: *See*—
Brothers, Jack A.; Doman, Robert C.; and McNally, Robert N., 4,158,569, Cl. 106-66.000.
Cory Food Services, Inc.: *See*—
Vitous, Charles J., 4,158,330, Cl. 99-295.000.
Cotton, Incorporated: *See*—
Winch, Allen R., 4,158,297, Cl. 68-22.00R.
Cournoyer, Roger. Screwdriver. 4,158,375, Cl. 145-50.00C.
Crafts, Robert L.: *See*—
Ysbrand, Floyd R.; and Crafts, Robert L., 4,158,870, Cl. 360-128.000.
Cramer, Frank B., to Clean Energy Corporation. Coal treatment apparatus. 4,158,697, Cl. 422-189.000.
Crompton & Knowles Corporation: *See*—
Broome, Jack, 4,158,252, Cl. 26-93.000.
Crown International, Inc.: *See*—
Stanley, Gerald R., 4,158,820, Cl. 330-149.000.
Crown Optical Company, Inc.: *See*—
Olsen, Donald G.; and Masi, Nicholas, 4,158,273, Cl. 51-284.00R.
Crutchfield, Marvin M.; and Upton, Charles J., to Monsanto Company. Detergent formulations containing tetrahydropyran or 1,4-dioxane polycarboxylates and method for using same. 4,158,635, Cl. 252-99.000.
Cryogenic Technology, Inc.: *See*—
Chellis, Fred F., 4,158,293, Cl. 62-6.000.
Cueilleron, Jean F., deceased: *See*—
Dazord, Jacques L.; Mongeot, Henri M.; Guillevic, Gildas J.; and Cueilleron, Jean F., deceased, 4,158,673, Cl. 260-606.50B.
Cuff, Frederick L.; and Walek, Walter J., to United Technologies Corporation. Selective loading of plastic molding compression molds. 4,158,537, Cl. 425-260.000.
Cummisford, Robert G.; Wasielewski, Richard J.; and Krueger, Robert K., to Krause Milling Company. Hydrolyzed amylaceous product and process of making the same. 4,158,574, Cl. 127-32.000.
Cunningham, Robert K. Swimming device. 4,158,245, Cl. 9-301.000.
Curtice, Walter R., to RCA Corporation. Pulse train generator. 4,158,784, Cl. 307-260.000.
Cutler-Hammer, Inc.: *See*—
Gutberlet, Robert C., 4,158,829, Cl. 335-201.000.
Dahn, Ursula; Hagenmaier, Hanspaul; Hohne, Helmut; Konig, Wilfried; Scheinpflug, Hans; and Zahner, Hans, to Bayer Aktiengesellschaft. Fungicidally active antibiotic from *Streptomyces tendae* Ettlinger. 4,158,608, Cl. 195-80.00R.
Daikin Kogyo Co., Ltd.: *See*—
Tatemoto, Masayoshi; and Nakagawa, Tsuneo, 4,158,678, Cl. 260-884.000.
Daimler-Benz Aktiengesellschaft: *See*—
Grabner, Christian; Krugener, Rolf; and Kurth, Hermann W., 4,158,299, Cl. 70-224.000.
Wuchner, Erwin; Heitmeyer, Ulrich; and Kostelezky, Walter, 4,158,841, Cl. 343-7.0VM.
Danfoss A/S: *See*—
Nielsen, Leif, 4,158,437, Cl. 236-92.00B.

Daniele, Phillip P., to Bell Telephone Laboratories, Incorporated. Telephone system open switching interval protection circuit. 4,158,755, Cl. 179-99.00H.

Dantzig, Jonathan A.; and Tyler, Derek E., to Swiss Aluminium Ltd. Filter for use in filtration of molten metal. 4,158,632, Cl. 210-510.000.

Darms, Roland; and Meindl, Hubert, to Ciba-Geigy Corporation. Phthalimides substituted by alkenylamino groups. 4,158,662, Cl. 260-326.00N.

Darnell, William E., to Towmotor Corporation. Positive crank case ventilation valve and internal combustion engine including the same. 4,158,353, Cl. 123-119.00B.

Dart Industries Inc.: *See—*
Allan, John L. H.; and Readio, Philip D., 4,158,593, Cl. 156-666.000.
Brescia, Anthony J.; Fecca, Edward G.; Wenczl, Stephen; and Schriever, Theodore W., 4,158,336, Cl. 108-111.000.
Dieckmann, Dale J., 4,158,640, Cl. 252-400.00R.
Readio, Philip D.; and Allan, John L. H., 4,158,592, Cl. 156-666.000.

D'Auria, Luigi; Ostrowsky, Daniel; and Jacques, Andre, to Thomson-CSF. Coaxial optical fibre cable. 4,158,478, Cl. 350-96.230.

Davis, Luther, Jr.; and Barrett, Harrison H., to Raytheon Company. Radiographic imaging system. 4,158,770, Cl. 250-272.000.

Dazord, Jacques L.; Mongeot, Henri M.; Guillevic, Gildas J.; and Cueilleron, Jean F., deceased (by Bouvier, Pierre M., Executor), to Etat Francais. Process for the synthesis of bis(alkyl sulphide)-decaborane (12). 4,158,673, Cl. 260-606.50B.

DCA-Diagnostic Corporation of America: *See—*
Rousseau, Robert; and Manganaro, Charles A., 4,158,547, Cl. 23-230.600.

Dear, Robert E. A.; and Brace, Neal O., to Ciba-Geigy Corporation. Polyfluoroalkylthio alcohols, esters and useful compositions therefrom. 4,158,672, Cl. 260-584.00R.

Decker, John J.; and Kantner, Donald J., to GTE Sylvania Incorporated. Glass-to-metal seal for electrochemical cells. 4,158,721, Cl. 429-174.000.

Degens, Alfredo. Composition board with improved polymeric skin. 4,158,712, Cl. 428-212.000.

Degens, Alfredo. Composition board with improved polymeric skin and method of preparing same. 4,158,713, Cl. 428-212.000.

Del Campo, Giovan B. Process for obtaining films and blocks of cellulose acetate particularly for rapid and preparative analytical electrophoresis and for immuno-techniques. 4,158,683, Cl. 264-41.000.

Dellamano, Harry A., to Beckman Instruments, Inc. Signal measuring and display control method and apparatus. 4,158,809, Cl. 324-99.00D.

Deman, Pierre; and Potage, Jean, to Thomson-CSF. Arrangement for discriminating speech signals from noise. 4,158,749, Cl. 179-1.0SC.

Demeny, Gary L.: *See—*
Bagby, Thomas L.; Demeny, Gary L.; and Smead, Robert G., 4,158,344, Cl. 118-630.000.

DeMichele, Ernest: *See—*
Roberts, Charles G.; and DeMichele, Ernest, 4,158,346, Cl. 123-1.00R.

Demick, Eugene; and Van Haasteren, Adrian J., Jr., to Bergen Expo Systems, Inc. Photographic film projection dissolve system for arc lamp projectors. 4,158,491, Cl. 353-90.000.

Denka Chemical Corporation: *See—*
Barone, Bruno J., 4,158,671, Cl. 260-546.000.

de Ponteves, Dominique; Naussac, Francois J.; and Dujols, Andre, to Societe de Fabrication d'Instruments de Mesure (S.F.I.M.). Optical sighting devices. 4,158,504, Cl. 356-247.000.

Derby, Palmer P.: *See—*
Bowen, Robert F.; and Derby, Palmer P., 4,158,464, Cl. 294-31.200.

Desaintfuscien, Jean P., to Thomson-CSF. Pulse regulation delay line modulator. 4,158,785, Cl. 307-265.000.

Detroit Marine Engineering Corporation: *See—*
Howell, George, 4,158,251, Cl. 24-152.000.

Dever, Gerald V., Jr., to Olin Corporation. Generation of polyurethane foam. 4,158,535, Cl. 425-145.000.

DeYoreo, Sal G., to Automatic Radio Mfg. Co., Inc. Electrical grill assembly and associated insulator spacer. 4,158,268, Cl. 43-112.000.

Diamond, Arthur S.: *See—*
Smith, Michael R.; Congleton, David B.; and Diamond, Arthur S., 4,158,715, Cl. 428-412.000.

Dianetti, Joseph C.; and Rybicki, Edward B., to American Optical Corporation. Optical system for inverted microscopes. 4,158,475, Cl. 350-50.000.

Dickinson, Gary R.: *See—*
Bischoff, Dennis E.; Dickinson, Gary R.; Hinshaw, Michael E.; and Brooker, Robert M., 4,158,694, Cl. 422-81.000.

Dickinson, Harry D. Safety traffic controller. 4,158,514, Cl. 404-6.000.

Dieckmann, Dale J., to Dart Industries Inc. Stable liquid antimony organic sulfur-containing compounds. 4,158,640, Cl. 252-400.00R.

Diemme S.p.A.: *See—*
Melandri, Primo, 4,158,332, Cl. 100-127.000.

DiFrancesco, Alphonse B.; and Hage, Charles T., to Eastman Kodak Company. Apparatus for producing collated copies in page sequential order. 4,158,500, Cl. 355-14.000.

Dilz, Albert E.: *See—*
Clemens, John E.; Stephens, Thomas C.; Dilz, Albert E.; and Hewlett, James A., 4,158,842, Cl. 343-7.0PF.

Dippold, Johann; and von Tirpitz, Wolf, to Feldmuhle Aktiengesellschaft. Wall panel and assembly. 4,158,338, Cl. 109-79.000.

Disston, Inc.: *See—*
Meadows, Robert J.; and Doolittle, Stephen D., 4,158,246, Cl. 15-28.000.

Dixon, Kenneth G. Method and apparatus for producing a three-dimensional form from a photographic image of that form. 4,158,325, Cl. 409-115.000.

Doi, Yoshikazu; and Sakai, Yutaka, to Fuji Photo Optical Co., Ltd. Inverted telephoto type super-wide angle lens. 4,158,482, Cl. 350-214.000.

Dolev, Moshe: *See—*
Bahry, Abraham; and Dolev, Moshe, 4,158,337, Cl. 109-59.00R.

Doll, Michael; Heseding, Anton; and Jasch, Erich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Cable net cooling tower jacket installation method. 4,158,255, Cl. 29-428.000.

Doman, Robert C.: *See—*
Brothers, Jack A.; Doman, Robert C.; and McNally, Robert N., 4,158,569, Cl. 106-66.000.

Doolittle, Stephen D.: *See—*
Meadows, Robert J.; and Doolittle, Stephen D., 4,158,246, Cl. 15-28.000.

Dorn, Alfred: *See—*
Cappel, Bert; and Dorn, Alfred, 4,158,799, Cl. 318-626.000.

Dorst-Keramikaschinen-Bau Otto Dorst U. Dipl.-Ing. Walter Schlegel: *See—*
Schubart, Rolf E. R., 4,158,691, Cl. 264-314.000.

Dow Chemical Company, The: *See—*
Bischoff, Dennis E.; Dickinson, Gary R.; Hinshaw, Michael E.; and Brooker, Robert M., 4,158,694, Cl. 422-81.000.
Morris, Earl D., Jr., 4,158,674, Cl. 260-650.00R.

Drobniak, Joseph M., to Powell Magnetic Industries, Inc. Transition alarm circuit. 4,158,839, Cl. 340-524.000.

Drummond, Warren W., to PPG Industries, Inc. Method and apparatus for forming fiber mat. 4,158,557, Cl. 65-2.000.

Dubal, Gajen P.: *See—*
Foreman, Robert W.; and Dubal, Gajen P., 4,158,579, Cl. 148-20.000.

Duesterhoeft, Donald A.: *See—*
Oxenreider, Terry; Duesterhoeft, Donald A.; and Erb, Edgar M., 4,158,382, Cl. 164-305.000.

Duffy, James V.: *See—*
Angres, Isaac; Duffy, James V.; and Matesky, Sol J., 4,158,649, Cl. 260-17.00R.

DuHaime, Raymond A.: *See—*
Lasto, Clifford S.; and DuHaime, Raymond A., 4,158,528, Cl. 417-163.000.

Duinker, Simon. Packing for single films. 4,158,409, Cl. 206-455.000.

Duinker, Simon, to N.V. Optische Industrie "De Oude Delft". Apparatus for scanning and processing information obtained by successively irradiating an object from a plurality of directions. 4,158,854, Cl. 358-111.000.

Dujols, Andre: *See—*
de Ponteves, Dominique; Naussac, Francois J.; and Dujols, Andre, 4,158,504, Cl. 356-247.000.

Dungs, Horst: *See—*
Weber, Heinrich; Dungs, Horst; Urbye, Klaus; Beckmann, Franz; Schmauch, Hugo; and Flasche, Karl H., 4,158,550, Cl. 44-13.000.

Dunlop, Thomas A. Hand-knitting method. 4,158,296, Cl. 66-4.000.

Du Pont de Nemours, E. I., and Company: *See—*
Scott, Leon S.; and Sommers, Roy W., 4,158,738, Cl. 562-416.000.

Durant, David R., to Jacoby-Tarbox Corporation. Sight glass and product cleaning system. 4,158,508, Cl. 356-385.000.

Durrett, Andrew M.; and Pawlak, Kenneth E., to Abbott Laboratories. Unidirectionally valved drip chamber, inlet port assembly useful for liquid collection containers. 4,158,362, Cl. 128-272.000.

E. R. Squibb & Sons, Inc.: *See—*
Gordon, Eric M., 4,158,657, Cl. 260-306.70C.

Eastman Kodak Company: *See—*
DiFrancesco, Alphonse B.; and Hage, Charles T., 4,158,500, Cl. 355-14.000.
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,158,658, Cl. 260-307.00D.
Maskasky, Joe E., 4,158,565, Cl. 96-29.00D.

Eaton Corporation: *See—*
Cornell, Charles R., 4,158,290, Cl. 60-445.000.

EcoLaire Incorporated: *See—*
Burkett, Jerry D., 4,158,527, Cl. 417-18.000.

Edwards, Laroy H.: *See—*
Cleveland, James D.; and Edwards, Laroy H., 4,158,732, Cl. 544-8.000.

Edwards, William J., to Singer Company, The. Hinged bobbin case plate. 4,158,340, Cl. 112-231.000.

Edwin Cooper, Inc.: *See—*
Papay, Andrew G., 4,158,633, Cl. 252-32.70E.

Ehedy, Gustav; Kemter, Heinz; Ponitz, Wilfried; Ehrlich, Engelbert; Politze, Walter; Scholtis, Walter; and Wunsch, Wolfgang, to VEB Wirkmaschinenbau Karl-Marx-Stadt. Stitch bonded fabrics, method and apparatus for making the same. 4,158,292, Cl. 66-190.000.

Ehrlich, Engelbert: *See—*
Ehedy, Gustav; Kemter, Heinz; Ponitz, Wilfried; Ehrlich, Engelbert; Politze, Walter; Scholtis, Walter; and Wunsch, Wolfgang, 4,158,292, Cl. 66-190.000.

Eichelberger, Charles W.: *See—*
Butler, Walter J.; and Eichelberger, Charles W., 4,158,804, Cl. 323-22.00R.

Eisai Co., Ltd.: *See—*
Takahashi, Toshio; and Tagaya, Ryosaku, 4,158,625, Cl. 209-524.000.

Eldred, Roger J., to General Motors Corporation. Radiation cured and monomer modified silicon elastomers. 4,158,617, Cl. 204-159.130.

Electric Power Research Institute, Inc.: *See—*
Kennon, Richard E., 4,158,864, Cl. 361-58.000.
Minnick, Lawrence E., 4,158,602, Cl. 176-36.00R.
Electroprint, Inc.: *See—*
Gardiner, Kenneth W.; and Pressman, Gerald L., 4,158,564, Cl. 96-1.00R.
Elektroschmelzwerk Kempten GmbH: *See—*
Petersen, Fritz; and Korsten, Andreas, 4,158,744, Cl. 13-25.000.
Ellis, Robert W.; and Manaton, Charles D., to Tampa Air Electronics. Combined microphone and accessory device. 4,158,813, Cl. 325-102.000.
Ellsberg, Thomas R., to C.P.P.L., Inc. Safety interlock system. 4,158,874, Cl. 361-172.000.
Elsner, Hans J.; Antol, Ronald F.; and Castner, Raymond P., to Westinghouse Electric Corp. Variable mounting assembly for transducers employed in nuclear reactor vessel inspection apparatus. 4,158,309, Cl. 73-641.000.
En, John, to Motorola, Inc. Improved apparatus for digital data synchronization. 4,158,748, Cl. 178-69.100.
Endo, Shinichiro: *See—*
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,158,435, Cl. 235-463.000.
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,158,834, Cl. 340-146.3MA.
Energy Research Foundation, The: *See—*
Carden, Peter O., 4,158,354, Cl. 126-270.000.
Environmental Devices Corporation: *See—*
Brainard, Edward C., II, 4,158,306, Cl. 73-170.00A.
Erb, Edgar M.: *See—*
Oxenreider, Terry; Duesterhoeft, Donald A.; and Erb, Edgar M., 4,158,382, Cl. 164-305.000.
Erb, Rene. Foldable container. 4,158,376, Cl. 150-0.500.
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, to SKF Kugellagerfabriken GmbH. Mechanism for lubricating the bearings of the cutting rollers of a roller bit. 4,158,394, Cl. 175-228.000.
Ernst, Thomas J.; Oborsh, Edward V.; and Oreel, Foppe E., to Ralston Purina Company. Food preservation. 4,158,706, Cl. 426-327.000.
Ershov, Vadim A.: *See—*
Volfkovich, Semen I.; Belov, Vladimir N.; Ershov, Vadim A.; Rozenberg, Evgeny K.; Shipov, Emmanuil I.; and Jumanova, Ljudmila V., 4,158,699, Cl. 422-189.000.
Etat Francais: *See—*
Dazord, Jacques L.; Mongeot, Henri M.; Guillevic, Gildas J.; and Cueilleron, Jean F., deceased, 4,158,673, Cl. 260-606.50B.
Eves, E. Eugene, II: *See—*
Bowen, Robert F.; Freedman, George; Teich, Wesley W.; Martel, Thomas J.; and Eves, E. Eugene, II, 4,158,760, Cl. 219-10.55E.
Exxon Research & Engineering Co.: *See—*
Baker, Richard H., 4,158,866, Cl. 361-86.000.
Chung, Chan I., 4,158,653, Cl. 260-33.6AQ.
Langer, Arthur W., Jr., 4,158,642, Cl. 252-429.00B.
Lyon, Richard K., 4,158,615, Cl. 204-157.10R.
Eymard, Pierre: *See—*
Michaud, Andre; and Eymard, Pierre, 4,158,862, Cl. 360-56.000.
F. Ili Maschino S.n.c.: *See—*
Maschio, Antonio, 4,158,390, Cl. 172-5.000.
Fabian, Gordon R.; Kammerer, Leo P.; and Maxedon, Lynn F., to Rockwell International Corporation. Method and apparatus for gyro erection. 4,158,312, Cl. 74-5.430.
Falluel, Jean-Pierre: *See—*
Cherbourg, Robert; Falluel, Jean-Pierre; and Menard, Michel, 4,158,270, Cl. 49-103.000.
Farnsworth, Charles W. Little bugger insect carrying and dispensing container. 4,158,267, Cl. 43-55.000.
Fazekas, Carl F.: *See—*
Gottschalk, Robert E.; Navarro, Felipe; and Fazekas, Carl F., 4,158,488, Cl. 352-243.000.
Gottschalk, Robert E.; Navarro, Felipe; and Fazekas, Carl F., 4,158,489, Cl. 352-243.000.
Gottschalk, Robert E.; Navarro, Felipe; and Fazekas, Carl F., 4,158,490, Cl. 352-243.000.
Fearon, Robert E.: *See—*
Peterson, Glen; and Fearon, Robert E., 4,158,433, Cl. 235-380.000.
Fecca, Edward G.: *See—*
Brescia, Anthony J.; Fecca, Edward G.; Wenczl, Stephen; and Schriever, Theodore W., 4,158,336, Cl. 108-111.000.
Feder, Aaron. Garment container. 4,158,406, Cl. 206-279.000.
Feldmuhle Aktiengesellschaft: *See—*
Dippold, Johann; and von Tirpitz, Wolf, 4,158,338, Cl. 109-79.000.
Fellows, Glenn E.: *See—*
Barnes, Roswell P., Jr.; and Fellows, Glenn E., 4,158,832, Cl. 340-38.00S.
Fenner, Hans; Auwarter, Wilhelm; and Stark, Karl-Heinz, to Ramseier & Jenzer AG, Carosseriewerke Bern. Box-body construction for busses. 4,158,465, Cl. 296-193.000.
Fer Fabbrica Europea Riscaldamento S.p.A.: *See—*
Trestin, Alessandro, 4,158,345, Cl. 122-214.000.
Feuerman, Arnold I. Gasoline-water emulsion. 4,158,551, Cl. 44-51.000.
Fiber Associates, Inc.: *See—*
Geyer, Charles J., Jr.; and White, Ben E., 4,158,698, Cl. 422-189.000.
Finegold, Hyman B., to Globe Tool and Engineering Company, The. High speed stator winder. 4,158,314, Cl. 74-23.000.
Fischer & Porter Co.: *See—*
Shauger, Herbert; and Schmoock, Roy, 4,158,765, Cl. 235-92.0NT.
Fishel, Richard L.: *See—*
Benkowski, William J.; Fishel, Richard L.; and Maurer, Francis J., 4,158,646, Cl. 260-2.300.
Fisher, Edwin P., to Honeywell Information Systems Inc. Transparent tri state latch. 4,158,891, Cl. 365-222.000.
Fisher, Robert J.; and Seaman, Jeffrey R., to Harman International Industries, Inc. Remote controlled rearview mirror. 4,158,483, Cl. 350-289.000.
Flasche, Karl H.: *See—*
Weber, Heinrich; Dungs, Horst; Urbye, Klaus; Beckmann, Franz; Schmauch, Hugo; and Flasche, Karl H., 4,158,550, Cl. 44-13.000.
Fleckensteim, Andrew J. Sensor device for water softener system. 4,158,628, Cl. 210-85.000.
Foerster, George S.: *See—*
Hebbar, Ranna K.; Rao, M. Vikram; and Foerster, George S., 4,158,563, Cl. 75-166.00C.
Foglia, Vincent F. P., to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines. Oscillating structure for exploration at sea. 4,158,517, Cl. 405-202.000.
Fohl, Timothy; and Hatch, William E., to GTE Sylvania Incorporated. Flash lamp assembly having heat-responsive indexing members. 4,158,493, Cl. 354-144.000.
Ford, Geoffrey E.; Pantelides, Antis; and Willsmer, Trevor R., to TI Fords Limited. Apparatus for deflecting bottles in bottle feeding apparatus. 4,158,624, Cl. 209-523.000.
Ford Motor Company: *See—*
Pett, Robert A.; Qaderi, S. Burhan A.; and Tabar, Ronald J., 4,158,688, Cl. 264-63.000.
Pett, Robert A.; Rao, V. Durga Nageswar; and Qaderi, S. Burhan A., 4,158,689, Cl. 264-63.000.
Foreman, Robert W.; and Dubal, Gajen P., to Park Chemical Company. Method for recycling heat treating salts. 4,158,579, Cl. 148-20.000.
Forward, Robert L., to Hughes Aircraft Company. Electromechanical transducer-coupled mechanical structure with negative capacitance compensation circuit. 4,158,787, Cl. 310-51.000.
Frackiewicz, Elzbieta: *See—*
Kalinowski, Leonard; Frackiewicz, Elzbieta; Janiszewska, Leonarda; Pawlik, Anna; Kikolska, Danuta; Pisarek, Jerzy; Szadkowska, Maria; and Switacz-Tomaszewska, Jadwiga, 4,158,607, Cl. 195-62.000.
Francis, Robert A. Pipe tapping bands. 4,158,461, Cl. 285-111.000.
Frantz, Earl L., to Carpenter Technology Corporation. Low expansion low resistivity composite powder metallurgy member and method of making the same. 4,158,719, Cl. 428-567.000.
Freedman, George: *See—*
Bowen, Robert F.; Freedman, George; Teich, Wesley W.; Martel, Thomas J.; and Eves, E. Eugene, II, 4,158,760, Cl. 219-10.55E.
Freimuth, John H.: *See—*
Campbell, Willis R.; and Freimuth, John H., 4,158,331, Cl. 100-5.000.
French, Douglas M.: *See—*
Hellman, Robert R.; and French, Douglas M., 4,158,812, Cl. 325-37.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Doll, Michael; Heseding, Anton; and Jasch, Erich, 4,158,255, Cl. 29-428.000.
Friedmann & Maier Aktiengesellschaft: *See—*
Rathmayr, Heinz, 4,158,442, Cl. 239-88.000.
Frohbieter, Edwin H., to Whirlpool Corporation. Dispensing system and method for dispensing discrete elements. 4,158,426, Cl. 222-1.000.
Fuji Electric Co., Ltd.: *See—*
Yasuhara, Takeshi; Tamai, Mitsuru; Yuhara, Tadanori; and Asano, Isamu, 4,158,311, Cl. 73-718.000.
Fuji Photo Optical Co., Ltd.: *See—*
Doi, Yoshikazu; and Sakai, Yutaka, 4,158,482, Cl. 350-214.000.
Fujisaki, Makoto: *See—*
Kawase, Yozo; and Fujisaki, Makoto, 4,158,525, Cl. 415-1.000.
Fujita, Keiichiro: *See—*
Akai, Shin-ichi; Nishida, Yasuhiro; and Fujita, Keiichiro, 4,158,851, Cl. 357-63.000.
Fujitsu Limited: *See—*
Iizuka, Yoshio, 4,158,861, Cl. 358-260.000.
Yonezaki, Jimpachi; Takahashi, Yoshihiro; Shimada, Toshihiko; and Okuyama, Katsuo, 4,158,754, Cl. 179-98.000.
Fujiwara, Yoshio: *See—*
Nishimura, Makoto; Naito, Keiichi; Fujiwara, Yoshio; and Kobayashi, Naotake, 4,158,725, Cl. 526-52.100.
Funke, Peter, to ALKEM GmbH. Sintering nuclear fuel pellets. 4,158,681, Cl. 264-0.500.
Fussenegger, Werner: *See—*
Illy, Hugo; and Fussenegger, Werner, 4,158,724, Cl. 521-90.000.
Gabano, Jean-Paul; and Broussely, Michel, to Saft-Societe des Accumulateurs Fixes et de Traction. High specific energy battery. 4,158,723, Cl. 429-197.000.
GAF Corporation: *See—*
Azorlosa, Julian L., 4,158,647, Cl. 260-13.000.
Schneider, Louis; and Graham, David E., 4,158,560, Cl. 71-118.000.
Gaghan, Stephen B.; and Stahl, Josiah W., Jr., to Greenville Steel Textile Machinery Corp. Simplified yarn coiler. 4,158,253, Cl. 28-289.000.
Galperin, Alexandr L.: *See—*
Onikov, Eduard A.; Galperin, Alexandr L.; Zabotin, Alexandr A.; Loschilin, Evgeny D.; and Kolobanov, Nikolai I., 4,158,373, Cl. 139-436.000.
Gamlin, Douglas W., to Imperial Chemical Industries Limited. Rock reinforcement. 4,158,519, Cl. 405-260.000.

Gard, George E.; Manning, Elvin K.; Rueggeberg, Werner; and Weinhold, Kerry L., to Armstrong Cork Company. Optoelectronic scanning device. 4,158,778, Cl. 250-461.00R.

Gardiner, Kenneth W.; and Pressman, Gerald L., to Electroprint, Inc. Method and apparatus for controlling the gray scale response of a multilayer image forming screen. 4,158,564, Cl. 96-1.00R.

Gardner, Phillip J.: *See*—
Scholz, John A.; and Gardner, Phillip J., 4,158,789, Cl. 313-218.000.

Gates, H. Gordon, to Gates & Sons, Inc. Clamping lock for looped ties. 4,158,452, Cl. 249-45.000.

Gates Rubber Company, The: *See*—
Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, 4,158,300, Cl. 72-148.000.

Gates & Sons, Inc.: *See*—
Gates, H. Gordon, 4,158,452, Cl. 249-45.000.

Gavin, David F.; Ardis, Alan E.; Katz, Lawrence E.; and Schellberg, John D., to Olin Corporation. Process for producing a purified 3,4-toluenediamine product and a mixture of 4- and 5-methylbenzotriazoles from a mixture of ortho-toluenediamine isomers. 4,158,660, Cl. 260-308.00B.

Gawlowski, Piotr: *See*—
Biolik, Felicjan; Gurgul, Franciszek; Odrobina, Stanislaw; Morys, Zygmunt; Wieczorek, Alfons; Wydmanski, Zenon; and Gawlowski, Piotr, 4,158,743, Cl. 13-25.000.

Gay, Charles F.: *See*—
Avery, James E.; and Gay, Charles F., 4,158,591, Cl. 156-643.000.

Gebruder Buhler AG: *See*—
Stillhard, Bruno; and Naf, Hans, 4,158,540, Cl. 425-550.000.

Geckeler, Siegfried, to Siemens Aktiengesellschaft. Gradient fiber. 4,158,479, Cl. 350-96.310.

General Battery Corporation: *See*—
Oxenreider, Terry; Duesterhoeft, Donald A.; and Erb, Edgar M., 4,158,382, Cl. 164-305.000.

General Binding Corporation: *See*—
Keller, Jack L.; and Wiermanski, Jerome J., 4,158,587, Cl. 156-216.000.

General Electric Company: *See*—
Barrett, David M., 4,158,776, Cl. 250-445.00T.
Butler, Walter J.; and Eichelberger, Charles W., 4,158,804, Cl. 323-22.00R.
Gerhold, Bruce W.; and Leibowitz, Herman M., 4,158,526, Cl. 415-115.000.
Keeling, K. Bailey, Jr., 4,158,294, Cl. 62-277.000.
Kindelspire, Thomas J., 4,158,828, Cl. 335-156.000.
McKinley, Frederick C.; and Anderson, Ivan R., 4,158,884, Cl. 364-431.000.
White, Dwain M., 4,158,728, Cl. 528-213.000.

General Filters, Inc.: *See*—
Yeagle, Richard J., 4,158,679, Cl. 261-106.000.

General Motors Corporation: *See*—
Beardmore, John M., 4,158,328, Cl. 92-212.000.
Eldred, Roger J., 4,158,617, Cl. 204-159.130.
Riddel, John W., 4,158,398, Cl. 180-108.000.

General Research of Electronics, Inc.: *See*—
Imazeki, Kazuyoshi; and Kazami, Koichi, 4,158,814, Cl. 325-362.000.

General Signal Corporation: *See*—
Schwab, Carl E., 4,158,840, Cl. 343-6.00R.

General Tire & Rubber Company, The: *See*—
Benkowski, William J.; Fishel, Richard L.; and Maurer, Francis J., 4,158,646, Cl. 260-2.300.

George, Brian V.: *See*—
Cook, Reginald K.; and George, Brian V., 4,158,604, Cl. 176-60.000.

Geosource Inc.: *See*—
Smither, Miles A., 4,158,819, Cl. 330-9.000.

Gerber, Hans: *See*—
Kosak, Wolfgang; Werner, Peter; Gerber, Hans; and Hidveghy, Ivan, 4,158,796, Cl. 318-245.000.

Gerhold, Bruce W.; and Leibowitz, Herman M., to General Electric Company. Turbine assembly including a rotatable liquid collection ring. 4,158,526, Cl. 415-115.000.

Gerkey, Kenneth S., to Westinghouse Electric Corp. Nuclear fuel pellet loading apparatus. 4,158,601, Cl. 176-30.000.

Geyer, Charles J., Jr.; and White, Ben E., to Fiber Associates, Inc. Apparatus for continuous xanthation and production of viscose spinning solution. 4,158,698, Cl. 422-189.000.

Gibbs, John W. Chimney waste heat collector requiring no building renovation. 4,158,439, Cl. 237-55.000.

Gierek, Adam; Bajka, Lech; and Adamczyk, Danuta, to Politechnika Slaska im. Wincentego Pstrowskiego. Method of preparation of the surfaces of products made of iron alloys, preceding the process of hot-dip aluminizing. 4,158,710, Cl. 427-310.000.

Gilberts, Alexander G., to Reliable Electric Company. Line protector. 4,158,869, Cl. 361-118.000.

Gilmour, Richard L. Shock absorbent display mounting apparatus and method. 4,158,266, Cl. 40-152.000.

Gitgarts, Dmitry A.: *See*—
Kotylev, Alexandr M.; Gitgarts, Dmitry A.; Ioffe, Jury S.; Prostyakov, Alexandr A.; and Krizental, Viktor I., 4,158,806, Cl. 324-65.00R.

Gleason, John G., to SmithKline Corporation. 7β-Acyloxy-3-acetoxymethyl cephalosporins. 4,158,733, Cl. 544-29.000.

Globe Tool and Engineering Company, The: *See*—
Finegold, Hyman B., 4,158,314, Cl. 74-23.000.

Gobush, William: *See*—
Sullivan, Paul F.; Moore, Randall W.; Hottel, Hoyt C., Jr.; Pelletier, Raymond G.; Gobush, William; and Lynch, Francis deS., 4,158,853, Cl. 358-93.000.

Godwin, Gurney L., to Westinghouse Electric Corp. Special motor windings for the suppression of a specific harmonic by expanding the electrical angle of phase belts. 4,158,788, Cl. 310-198.000.

Goi, Mitsuhiro; Miyashita, Masahiko; and Hashimoto, Tokio, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for preparing sorbic acid. 4,158,741, Cl. 562-599.000.

Goldberg, Marvin E.: *See*—
Baer, Ronald W.; and Goldberg, Marvin E., 4,158,704, Cl. 424-72.000.

Goldman, Abraham, to RCA Corporation. Aqueous photoresist comprising casein and methylol acrylamide. 4,158,566, Cl. 96-36.200.

Goldstone, Bertram J.: *See*—
Shapiro, Gerald N.; Goldstone, Bertram J.; Simone, Joseph D.; and Spignese, Edward E., 4,158,888, Cl. 364-726.000.

Gomez, Ismael M. Tether ball apparatus. 4,158,458, Cl. 273-95.00A.

Goodyear Tire & Rubber Company, The: *See*—
Pearson, Charles J.; and Saracsan, Jeffrey W., 4,158,378, Cl. 152-353.00R.

Gordon, Eric M., to E. R. Squibb & Sons, Inc. Thiooxime penicillin derivatives. 4,158,657, Cl. 260-306.70C.

Gordon, James F., to Zeta Research, Inc. Convertible graphic recorder. 4,158,846, Cl. 346-136.000.

Gorike, Rudolf, to AKG Akustische u.Kino-Gerate Gesellschaft m.b.H. Headphone of circumaural design. 4,158,753, Cl. 179-182.00R.

Goto, Osamu; Watanabe, Masao; and Kadoshima, Yoshio, to Honda Giken Kogyo Kabushiki Kaisha. Ignition timing control system for an internal combustion engine. 4,158,349, Cl. 123-117.00A.

Gottschalk, Robert E.; Navarro, Felipe; and Fazekas, Carl F., to Panavision, Incorporated. Body-mounted support device for motion picture camera. 4,158,488, Cl. 352-243.000.

Gottschalk, Robert E.; Navarro, Felipe; and Fazekas, Carl F., to Panavision, Incorporated. Body-mounted camera support apparatus. 4,158,489, Cl. 352-243.000.

Gottschalk, Robert E.; Navarro, Felipe; and Fazekas, Carl F., to Panavision, Incorporated. Body-mounted support device for motion picture camera. 4,158,490, Cl. 352-243.000.

Gould, Russell J., to Signode Corporation. Hot knife welds in thermoplastic strap. 4,158,711, Cl. 428-57.000.

Grabner, Christian; Krugener, Rolf; and Kurth, Hermann W., to Daimler-Benz Aktiengesellschaft. Door lock for motor vehicles. 4,158,299, Cl. 70-224.000.

Graham, David E.: *See*—
Schneider, Louis; and Graham, David E., 4,158,560, Cl. 71-118.000.

Grasso, James V., to Inland Manufacturing Company. Electric dryer construction for vehicle radiators. 4,158,262, Cl. 34-202.000.

Gray, Gerald A., Jr.; and Steiner, Edward L., to Xerox Corporation. Operator console for a reproduction machine. 4,158,886, Cl. 364-518.000.

Gray, Lew T.: *See*—
Reusser, Robert E.; Gray, Lew T.; and Marrs, Oren L., 4,158,371, Cl. 138-145.000.

Greenville Steel Textile Machinery Corp.: *See*—
Gaghan, Stephen B.; and Stahl, Josiah W., Jr., 4,158,253, Cl. 28-289.000.

Greiner, Egon; Mockel, Karl-Heinz; and Thorwirth, Gunter, to Jenoptik Jena G.m.b.H. Device for testing structures. 4,158,502, Cl. 356-71.000.

Grunert, Kurt A.: *See*—
Bratkowski, Walter V.; and Grunert, Kurt A., 4,158,827, Cl. 335-16.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
Stewart, James A., 4,158,752, Cl. 179-2.50R.

GTE Sylvania Incorporated: *See*—
Decker, John J.; and Kantner, Donald J., 4,158,721, Cl. 429-174.000.
Fohl, Timothy; and Hatch, William E., 4,158,493, Cl. 354-144.000.
Morris, James C.; Newell, P. Bruce; and Scholz, John A., 4,158,878, Cl. 362-3.000.
Scholz, John A.; and Gardner, Phillip J., 4,158,789, Cl. 313-218.000.

Guenther, Robert P.; and Zucker, Melvin S., deceased (by Zucker, Ethel, administratrix), to Bell Telephone Laboratories, Incorporated. Waveguide expansion joint. 4,158,825, Cl. 333-257.000.

Guerton, Jean-Pierre; Waleckx, Jean; and Monville, Jean-Michel, to SKF Compagnie d'Applications Mecaniques. Twister mechanism with elastic part. 4,158,282, Cl. 57-58.720.

Guillevic, Gildas J.: *See*—
Dazord, Jacques L.; Mongeot, Henri M.; Guillevic, Gildas J.; and Cueilleron, Jean F., deceased, 4,158,673, Cl. 260-606.50B.

Gulf Oil Corporation: *See*—
Larson, Olaf A.; and Matthews, Charles W., 4,158,467, Cl. 299-2.000.
Lynch, Thomas J.; and Rowatt, Robert J., 4,158,571, Cl. 106-271.000.

Gulf Research & Development Company: *See*—
Lese, Henri K.; and Wynne, Francis E., 4,158,740, Cl. 562-549.000.
Schulz, Johann G. D.; and Onopchenko, Anatoli, 4,158,739, Cl. 562-543.000.
Selwitz, Charles M.; and Thayer, Helen I., 4,158,664, Cl. 260-346.740.
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., 4,158,621, Cl. 208-114.000.
Tsai, Shirley C., 4,158,638, Cl. 208-11.0LE.

Gurgul, Franciszek: *See*—
Biolik, Felicjan; Gurgul, Franciszek; Odrobina, Stanislaw; Morys, Zygmunt; Wieczorek, Alfons; Wydmanski, Zenon; and Gawlowski, Piotr, 4,158,743, Cl. 13-25.000.

Gutberlet, Robert C., to Cutler-Hammer, Inc. Electromagnetically operated DC power contactor. 4,158,829, Cl. 335-201.000.

Hage, Charles T.: *See*—
DiFrancesco, Alphonse B.; and Hage, Charles T., 4,158,500, Cl. 355-14.000.

Hagenmaier, Hanspaul: *See*—
Dahn, Ursula; Hagenmaier, Hanspaul; Hohne, Helmut; Konig, Wilfried; Scheinpflug, Hans; and Zahner, Hans, 4,158,608, Cl. 195-80.00R.

Haggard, Richard A.: *See*—
Lewis, Sheldon N.; and Haggard, Richard A., 4,158,736, Cl. 560-205.000.

Hagiwara, Shyoichi: *See*—
Iwata, Minoru; Yasuda, Takeru; and Hagiwara, Shyoichi, 4,158,289, Cl. 60-276.000.

Hall, Douglas C.; and Schroeder, Charles R. Dispensing package. 4,158,411, Cl. 206-531.000.

Halliburton Company: *See*—
Smith, Lance G.; and Knoll, Jerry N., 4,158,510, Cl. 366-16.000.

Halpaap, Herbert; Krebs, Karl-Friedrich; and Heinz, Hans, to Merck Patent Gesellschaft mit beschrankter Haftung. Coated carrier materials for thin layer chromatography having a concentrating zone. 4,158,626, Cl. 210-31.00C.

Hamano, Masaaki: *See*—
Yajima, Seishi; Hayashi, Josaburo; Omori, Mamoru; Kayano, Hideo; and Hamano, Masaaki, 4,158,687, Cl. 264-60.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Hand-held labeler. 4,158,590, Cl. 156-384.000.

Hammerel, Richard J., to Kewanee Industries, Inc. Cleaner and grease emulsifier. 4,158,644, Cl. 252-547.000.

Hamprecht, Gerhard: *See*—
Stubenrauch, Gerd; Hamprecht, Gerhard; Wuerzer, Bruno; and Retzlaff, Guenter, 4,158,559, Cl. 71-91.000.

Hanselmann, Dieter; Prohaska, Hans; and Schubert, Karl-Friedrich, to ITT Industries, Inc. Rear window cleaning apparatus for automotive vehicles. 4,158,247, Cl. 15-250.300.

Hansen, Egon; and Hansen, Gregg E. Marble shooting sight. 4,158,259, Cl. 33-262.000.

Hansen, Gregg E.: *See*—
Hansen, Egon; and Hansen, Gregg E., 4,158,259, Cl. 33-262.000.

Hapgood, William H., to Raytheon Company. Self-pumping water boiler system. 4,158,386, Cl. 165-48.00R.

Hapgood, William H., to Raytheon Company. Self-pumping water boiler system. 4,158,438, Cl. 237-7.000.

Hardesty, Thomas K. C., to United States of America, Navy. Pyrotechnic separation device. 4,158,322, Cl. 89-1.00B.

Harlan, Wayne E., to RCA Corporation. Video signal translating circuit. 4,158,852, Cl. 358-35.000.

Harman International Industries, Inc.: *See*—
Fisher, Robert J.; and Seaman, Jeffrey R., 4,158,483, Cl. 350-289.000.

Hartwell Corporation: *See*—
Henrichs, Bernard W., 4,158,463, Cl. 292-341.180.

Harwylo, Frank Z., to RCA Corporation. Heterojunction semiconductor device. 4,158,849, Cl. 357-16.000.

Hashimoto, Tokio: *See*—
Goi, Mitsuhiro; Miyashita, Masahiko; and Hashimoto, Tokio, 4,158,741, Cl. 562-599.000.

Hasman, John M., to SCM Corporation. Hydrogenation of glyceride oils. 4,158,665, Cl. 260-409.000.

Hasman, John M., to SCM Corporation. Stearine production. 4,158,666, Cl. 260-409.000.

Hasselbacher, Wilhelm. Connector for spaced metal parts. 4,158,512, Cl. 403-294.000.

Hatada, Masamichi: *See*—
Kuroi, Hisashi; Hatada, Masamichi; Morita, Kumio; and Tanaka, Eiji, 4,158,792, Cl. 315-86.000.

Hatch, William E.: *See*—
Fohl, Timothy; and Hatch, William E., 4,158,493, Cl. 354-144.000.

Hattori, Hiroyuki; Ogawa, Hiroshi; Kishi, Hirotoshi; Umezawa, Kazumi; and Sagara, Seiji, to Canon Kabushiki Kaisha. Buffer device for the scanning mechanism of an electrostatic copier. 4,158,499, Cl. 355-8.000.

Hattori, Minoru: *See*—
Kato, Nobukatsu; Takase, Tsutomu; Morimoto, Yoshio; Kataoka, Takashi; and Hattori, Minoru, 4,158,650, Cl. 260-19.0UA.

Haulamatic Corporation: *See*—
Alcott, David K., 4,158,797, Cl. 318-371.000.

Hawkes, William S.: *See*—
Barry, John, 4,158,271, Cl. 49-386.000.

Hayashi, Josaburo: *See*—
Yajima, Seishi; Hayashi, Josaburo; Omori, Mamoru; Kayano, Hideo; and Hamano, Masaaki, 4,158,687, Cl. 264-60.000.

Hayashi, Takeshi, to Kyoei Zoki Kabushiki Kaisha. Golf ball collector. 4,158,418, Cl. 414-440.000.

Hazeltine Corporation: *See*—
Kerbel, Sheldon J., 4,158,859, Cl. 358-228.000.

Heard, James L.: *See*—
Pruznick, Michael D.; Keller, Bruce W.; Phelps, James R.; Wolfson, Gerald; and Heard, James L., 4,158,838, Cl. 340-750.000.

Hebbar, Ranna K.; Rao, M. Vikram; and Foerster, George S., to N L Industries, Inc. Low antimonial lead alloy for making grids for use in maintenance free batteries. 4,158,563, Cl. 75-166.00C.

Hegge, Hiram B. Dispenser for particulate material. 4,158,427, Cl. 222-317.000.

Hegler, Ralph P.: *See*—
Hegler, Wilhelm; and Hegler, Ralph P., 4,158,534, Cl. 425-142.000.

Hegler, Wilhelm; and Hegler, Ralph P., to Hegler, Wilhelm. Apparatus for cutting openings at arbitrarily selectable intervals into pipes. 4,158,534, Cl. 425-142.000.

Heguri, Kazuyoshi: *See*—
Yamashita, Katsuji; Umetsu, Hiroshi; Heguri, Kazuyoshi; and Yoshida, Kasumi, 4,158,545, Cl. 23-230.00R.

Heinsen, Edward A.; Marion, Andre F.; and Osborne, Thomas E., to Hewlett-Packard Company. Interactive wristwatch calculator. 4,158,285, Cl. 58-23.00R.

Heinz, Hans: *See*—
Halpaap, Herbert; Krebs, Karl-Friedrich; and Heinz, Hans, 4,158,626, Cl. 210-31.00C.

Heinzl, Joachim; and Kattner, Erich, to Siemens Aktiengesellschaft. Piezoelectric operated printer head for ink-operated mosaic printer units. 4,158,847, Cl. 346-140.00R.

Heitmeyer, Ulrich: *See*—
Wuchner, Erwin; Heitmeyer, Ulrich; and Kostelezky, Walter, 4,158,841, Cl. 343-7.0VM.

Hellman, Robert R.; and French, Douglas M., to Westport International. Radio transmitter with intermixed controls. 4,158,812, Cl. 325-37.000.

Helms, William R. Method and apparatus for elevating load-bearing access devices. 4,158,515, Cl. 404-72.000.

Hemsath, James R.: *See*—
Kiechka, Ernest W.; and Hemsath, James R., 4,158,541, Cl. 432-116.000.

Henrichs, Bernard W., to Hartwell Corporation. Adjustable keeper for rotary latches. 4,158,463, Cl. 292-341.180.

Hentschel, Volkmar; and Warner, Gustav, to Braunschweigische Maschinenbauanstalt. Conical centrifugal basket. 4,158,573, Cl. 127-19.000.

Herbenar, Edward J., to TRW Inc. Pivot joint. 4,158,511, Cl. 403-113.000.

Hercules Incorporated: *See*—
Rave, Terence W., 4,158,595, Cl. 162-157.00R.

Hermann Hemscheidt Maschinenfabrik, GmbH & Co.: *See*—
Krieger, Karl, 4,158,326, Cl. 91-508.000.

Heseding, Anton: *See*—
Doll, Michael; Heseding, Anton; and Jasch, Erich, 4,158,255, Cl. 29-428.000.

Hewlett, James A.: *See*—
Clemens, John E.; Stephens, Thomas C.; Dilz, Albert E.; and Hewlett, James A., 4,158,842, Cl. 343-7.0PF.

Hewlett-Packard Company: *See*—
Heinsen, Edward A.; Marion, Andre F.; and Osborne, Thomas E., 4,158,285, Cl. 58-23.00R.

Hidveghy, Ivan: *See*—
Kosak, Wolfgang; Werner, Peter; Gerber, Hans; and Hidveghy, Ivan, 4,158,796, Cl. 318-245.000.

Himmel, David P., to Recognition Equipment Incorporated. Laser measuring system for inspection. 4,158,507, Cl. 356-376.000.

Hines, Jimmy J.: *See*—
Price, Charles R.; Hines, Jimmy J.; and Howell, Ronald L., 4,158,682, Cl. 264-40.400.
Price, Charles R.; Hines, Jimmy J.; and Howell, Ronald L., 4,158,690, Cl. 264-115.000.

Hinshaw, Michael E.: *See*—
Bischoff, Dennis E.; Dickinson, Gary R.; Hinshaw, Michael E.; and Brooker, Robert M., 4,158,694, Cl. 422-81.000.

Hiraguri, Seisuke, to Victor Company of Japan, Ltd. Jitter measuring apparatus. 4,158,857, Cl. 358-139.000.

Hirasawa, Masataka, to Tokyo Shibaura Electric Co., Ltd. Display device driving voltage providing circuit. 4,158,786, Cl. 307-296.00R.

Hirata, Akio, to Tokyo Shibaura Denki Kabushiki Kaisha. Control system of alternating current motors. 4,158,801, Cl. 318-801.000.

Hitachi, Ltd.: *See*—
Akimoto, Seiichi; Watanabe, Mitsuhiro; Yoshida, Tomiharu; Sugaya, Zunichi; Saito, Takashi; and Ishii, Yoshimi, 4,158,600, Cl. 176-30.000.
Kadono, Shinji; Chiba, Tsuneyo; and Umezawa, Kiyoshi, 4,158,883, Cl. 364-200.000.
Yamashita, Katsuji; Umetsu, Hiroshi; Heguri, Kazuyoshi; and Yoshida, Kasumi, 4,158,545, Cl. 23-230.00R.

Ho, Chih-Ming, to University of Southern California. Optical pressure transducer of randomly distributed fiber optics. 4,158,310, Cl. 73-705.000.

Hoffmann, Gunter; and Ramspeck, Klaus, to Braun Aktiengesellschaft. Pick-up arms for record players. 4,158,459, Cl. 274-23.00R.

Hoffmann-La Roche Inc.: *See*—
Steffen, Hans; and Schmidt, Dieter, 4,158,707, Cl. 424-244.000.

Hogan, William F., to Spectrum X-Ray Corporation. X-ray apparatus. 4,158,777, Cl. 250-445.00R.

Hohne, Helmut: *See*—
Dahn, Ursula; Hagenmaier, Hanspaul; Hohne, Helmut; Konig, Wilfried; Scheinpflug, Hans; and Zahner, Hans, 4,158,608, Cl. 195-80.00R.

Holland-Letz, Guenter, to Nixdorf Computer AG. Device for separating documents, cards and the like, especially paper money bills. 4,158,456, Cl. 271-118.000.

Holme, John: *See—*
Jones, John D.; and Holme, John, 4,158,656, Cl. 260-123.500.
Holt, William D., to Lucas Industries Limited. Control circuits for windscreen wipers for road vehicles. 4,158,798, Cl. 318-444.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Goto, Osamu; Watanabe, Masao; and Kadoshima, Yoshio, 4,158,349, Cl. 123-117.00A.
Honeywell Information Systems Inc.: *See—*
Fisher, Edwin P., 4,158,891, Cl. 365-222.000.
Honma, Kenichiro, legal representative: *See—*
Honma, Kokichi, deceased; and Kameyama, Yoshio, 4,158,567, Cl. 96-36.300.
Honma, Kokichi, deceased (by Honma, Kenichiro, legal representative); and Kameyama, Yoshio, to Toppan Printing Co., Ltd. Method of screen gravure photoengraving. 4,158,567, Cl. 96-36.300.
Honshyuseishi Kabushiki Kaishya: *See—*
Ohmori, Koichiro, 4,158,429, Cl. 226-34.000.
Horn, Cyrill; and Horn, Wayne J. Frame and body straightening equipment. 4,158,303, Cl. 72-457.000.
Horn, Wayne J.: *See—*
Horn, Cyrill; and Horn, Wayne J., 4,158,303, Cl. 72-457.000.
Hoshidenki-Seizo Kabushiki Kaisha: *See—*
Uda, Masayuki, 4,158,254, Cl. 29-25.180.
Hottel, Hoyt C., Jr.: *See—*
Sullivan, Paul F.; Moore, Randall W.; Hottel, Hoyt C., Jr.; Pelletier, Raymond G.; Gobush, William; and Lynch, Francis deS., 4,158,853, Cl. 358-93.000.
Howell, George, to Detroit Marine Engineering Corporation. Button construction for tufted boat upholstery. 4,158,251, Cl. 24-152.000.
Howell, Ronald L.: *See—*
Price, Charles R.; Hines, Jimmy J.; and Howell, Ronald L., 4,158,682, Cl. 264-40.400.
Price, Charles R.; Hines, Jimmy J.; and Howell, Ronald L., 4,158,690, Cl. 264-115.000.
Hoyer, Horst W. System and method for viewing a three-dimensional image using a two-dimensional drawing. 4,158,481, Cl. 350-144.000.
Hudson, Walter A.: *See—*
Seelenbinder, Terry G.; Hudson, Walter A.; and Oddo, Eugene P., 4,158,495, Cl. 354-318.000.
Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, to Gates Rubber Company, The. Apparatus for producing a spirally wound electrochemical cell. 4,158,300, Cl. 72-148.000.
Hughes Aircraft Company: *See—*
Forward, Robert L., 4,158,787, Cl. 310-51.000.
Pruznick, Michael D.; Keller, Bruce W.; Phelps, James R.; Wolfson, Gerald; and Heard, James L., 4,158,838, Cl. 340-750.000.
Huliganga, Ernie F.: *See—*
Wang, Samuel S.; and Huliganga, Ernie F., 4,158,623, Cl. 209-166.000.
Humphrey, Robert: *See—*
Wiland, Lawrence; Humphrey, Robert; and Consiglio, Peter, 4,158,256, Cl. 32-12.000.
Humphries, Waymon; and Nahas, Joseph A., to United States of America, Navy. Expanding stabilizing fin cup. 4,158,447, Cl. 244-3.270.
Hydro, Paul J. Jump rope handles. 4,158,457, Cl. 272-75.000.
Ide, Susumu: *See—*
Irie, Hiroyuki; Ide, Susumu; and Matsuo, Tamotsu, 4,158,860, Cl. 358-230.000.
Iemenschot, Johannes A.: *See—*
Tops, Adrianus C.; and Iemenschot, Johannes A., 4,158,867, Cl. 360-99.000.
Iida, Kazuyoshi: *See—*
Matsumoto, Masayasu; Iida, Kazuyoshi; Kondo, Yoshikazu; Mizuno, Keiichiro; Nomoto, Sadao; Murayama, Noriaki; Watanabe, Kei; and Katayama, Tomonori, 4,158,401, Cl. 181-210.000.
Iizuka, Yoshio, to Fujitsu Limited; and Matsushita Graphic Communication Systems, Inc. Facsimile communication system and method. 4,158,861, Cl. 358-260.000.
Illy, Hugo; and Fussenegger, Werner, to Ciba-Geigy Corporation. Tris-tetrazoles as chemical blowing agents. 4,158,724, Cl. 521-90.000.
Imazeki, Kazuyoshi; and Kazami, Koichi, to General Research of Electronics, Inc. Automatic overload protection system. 4,158,814, Cl. 325-362.000.
Imperial Chemical Industries Limited: *See—*
Gamlin, Douglas W., 4,158,519, Cl. 405-260.000.
Potter, Stephen E., 4,158,675, Cl. 260-653.700.
Ingemarsson, Gosta I., to AB Kalle-Regulatorer. Method and apparatus for extracting waste material. 4,158,627, Cl. 210-49.000.
Inland Manufacturing Company: *See—*
Grasso, James V., 4,158,262, Cl. 34-202.000.
Inoue, Yoshito, to Toyo Seikan Kaisha, Ltd. Method of and apparatus for cutting out the packaging material of a cylindrical package. 4,158,417, Cl. 414-412.000.
Instytut Przemyslu Mleczarskiego: *See—*
Kalinowski, Leonard; Frackiewicz, Elzbieta; Janiszewska, Leonarda; Pawlik, Anna; Kikolska, Danuta; Pisarek, Jerzy; Szadkowska, Maria; and Switacz-Tomaszewska, Jadwiga, 4,158,607, Cl. 195-62.000.
International Business Machines Corporation: *See—*
Berger, Horst H.; and Wiedmann, Siegfried, 4,158,783, Cl. 307-213.000.
Burland, Donald M., 4,158,890, Cl. 365-119.000.
Keller, John H.; and McKenna, Charles M., 4,158,589, Cl. 156-345.000.
Mathisen, Einar S.; Schumann, Paul A., Jr.; and Tong, Alvin H., 4,158,505, Cl. 356-308.000.
Zahorsky, James T., 4,158,837, Cl. 340-804.000.
International Nickel Company, Inc., The: *See—*
Luch, Daniel; and Chart, John E., 4,158,612, Cl. 204-12.000.
International Standard Electric Corporation: *See—*
Wouters, Joannes C. A. M.; and Witters, Hugo F. J., 4,158,824, Cl. 333-213.000.
International Tapetronics Corporation: *See—*
Jenkins, John P., 4,158,868, Cl. 360-109.000.
International Telephone and Telegraph Corporation: *See—*
McCartney, Ronald L., 4,158,476, Cl. 350-96.210.
Internatonal Standard Electric Corporation: *See—*
Phillips, Michael J.; and Archer, John D., 4,158,477, Cl. 350-96.210.
Ioffe, Jury S.: *See—*
Kotylev, Alexandr M.; Gitgarts, Dmitry A.; Ioffe, Jury S.; Prostyakov, Alexandr A.; and Krizental, Viktor I., 4,158,806, Cl. 324-65.00R.
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., to Eastman Kodak Company. Bichromophoric benzoxazole-styrene ultraviolet stabilizers and their use in organic compositions. 4,158,658, Cl. 260-307.00D.
Irie, Hiroyuki; Ide, Susumu; and Matsuo, Tamotsu, to Matsushita Electric Industrial Co., Ltd. Method for driving an X-Y matrix type liquid crystal display panel. 4,158,860, Cl. 358-230.000.
Irvine, Alexander M.: *See—*
Blackburn, John B.; Irvine, Alexander M.; Sutcliffe, Michael; and McLaren, George, 4,158,572, Cl. 106-288.00Q.
Irwin, Robert G., to PPG Industries, Inc. Preparing magnesium oxychloride and/or oxysulfate cements. 4,158,570, Cl. 106-106.000.
Isaacson, Bruce G.: *See—*
Schroeder, Kenneth W.; Isaacson, Bruce G.; and Lorenzi, Donald E., 4,158,873, Cl. 361-149.000.
Ishii, Yoshimi: *See—*
Akimoto, Seiichi; Watanabe, Mitsuhiro; Yoshida, Tomiharu; Sugaya, Zunichi; Saito, Takashi; and Ishii, Yoshimi, 4,158,600, Cl. 176-30.000.
Ishima, Kazumi, to Ricoh Co., Ltd. Electrostatic recording multi-stylus electrode device. 4,158,848, Cl. 346-155.000.
Ishimura, Susumu: *See—*
Sasaki, Kantaro; Kobayashi, Sumio; Sugitani, Yasuo; and Ishimura, Susumu, 4,158,380, Cl. 164-147.000.
Ishizuka, Hiroshi; and Sugano, Yoshiaki, to Ishizuka, Hiroshi. Electrothermal fluidized bed furnace. 4,158,695, Cl. 422-145.000.
Ito, Ryozo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary engine with an oscillation damping layer. 4,158,531, Cl. 418-83.000.
ITT Industries, Inc.: *See—*
Hanselmann, Dieter; Prohaska, Hans; and Schubert, Karl-Friedrich, 4,158,247, Cl. 15-250.300.
Iwamoto, Hisao: *See—*
Kurokawa, Masahiro; and Iwamoto, Hisao, 4,158,359, Cl. 128-630.000.
Iwata, Minoru; Yasuda, Takeru; and Hagiwara, Shyoichi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Industry Co., Ltd. Electromagnetic vacuum switching valve for use in an exhaust gas cleaning apparatus. 4,158,289, Cl. 60-276.000.
J. M. Huber Corporation: *See—*
Price, Charles R.; Hines, Jimmy J.; and Howell, Ronald L., 4,158,682, Cl. 264-40.400.
Price, Charles R.; Hines, Jimmy J.; and Howell, Ronald L., 4,158,690, Cl. 264-115.000.
Jackson, Harold P., to McDonough Power Equipment, Inc. Riding mower with grass collecting system. 4,158,279, Cl. 56-202.000.
Jackson, John M., to Cleamax Limited. High speed can feed mechanism. 4,158,405, Cl. 198-480.000.
Jacoby-Tarbox Corporation: *See—*
Durant, David R., 4,158,508, Cl. 356-385.000.
Jacques, Andre: *See—*
D'Auria, Luigi; Ostrowsky, Daniel; and Jacques, Andre, 4,158,478, Cl. 350-96.230.
Jahelka, James R.; and Bemis, Edward D., to NCR Corporation. Control system. 4,158,800, Cl. 318-685.000.
James, Robert G. Infinite ratio transmission. 4,158,317, Cl. 74-796.000.
Janiszewska, Leonarda: *See—*
Kalinowski, Leonard; Frackiewicz, Elzbieta; Janiszewska, Leonarda; Pawlik, Anna; Kikolska, Danuta; Pisarek, Jerzy; Szadkowska, Maria; and Switacz-Tomaszewska, Jadwiga, 4,158,607, Cl. 195-62.000.
Janssen, Peter J. H., to U.S. Philips Corporation. Television system with two FM sound carriers. 4,158,858, Cl. 358-143.000.
Jasch, Erich: *See—*
Doll, Michael; Heseding, Anton; and Jasch, Erich, 4,158,255, Cl. 29-428.000.
Jasniewicz, Zbigniew; Knyszewski, Jan; Osrodek, Tadeusz; Kielczynski, Zdzislaw; and Stefanski, Lech, to Przedsiebiorstwo Polowow Dalekomorskich I Uslug Rybackich "Dalmor". Apparatus for shelling marine crustacea. 4,158,249, Cl. 17-73.000.
Jenkins, John P., to International Tapetronics Corporation. Universally adjustable head support for tape deck. 4,158,868, Cl. 360-109.000.
Jenoptik Jena G.m.b.H.: *See—*
Greiner, Egon; Mockel, Karl-Heinz; and Thorwirth, Gunter, 4,158,502, Cl. 356-71.000.
Jones, Andrew R., to Westinghouse Electric Corp. Conversion of coal into hydrocarbons. 4,158,637, Cl. 208-449.00R.
Jones, John D.; and Holme, John, to Canadian Patents and Development Limited. Oilseed processing. 4,158,656, Cl. 260-123.500.
Jones, John W., to SunTerra Corporation. Environmentally assisted heating and cooling system. 4,158,291, Cl. 60-641.000.

Journee, Maurice A., to Paul Journee, S.A. Device for securing a wiper blade to an arm. 4,158,513, Cl. 403-316.000.
Joy Manufacturing Company: *See*—
Archer, William E., 4,158,702, Cl. 423-210.000.
Jumanova, Ljudmila V.: *See*—
Volfkovich, Semen I.; Belov, Vladimir N.; Ershov, Vadim A.; Rozenberg, Evgeny K.; Shipov, Emmanuil I.; and Jumanova, Ljudmila V., 4,158,699, Cl. 422-189.000.
Juskey, John S.: *See*—
Amariti, Luigi; Juskey, John S.; Azari, Shapoor; and Kucera, Thomas J., 4,158,634, Cl. 252-62.10P.
Justus, Edgar J., to Beloit Corporation. Traveling wire web former. 4,158,596, Cl. 162-213.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Komatsu, Noboru; and Arai, Tohru, 4,158,578, Cl. 148-6.110.
Kadono, Shinji; Chiba, Tsuneyo; and Umezawa, Kiyoshi, to Hitachi, Ltd. Refresh control system. 4,158,883, Cl. 364-200.000.
Kadoshima, Yoshio: *See*—
Goto, Osamu; Watanabe, Masao; and Kadoshima, Yoshio, 4,158,349, Cl. 123-117.00A.
Kaiser Aluminum & Chemical Corporation: *See*—
Andersen, John N.; and Bell, Norman, 4,158,701, Cl. 423-119.000.
Masaryk, Joseph S., 4,158,685, Cl. 264-43.000.
Kalinowski, Leonard; Frackiewicz, Elzbieta; Janiszewska, Leonarda; Pawlik, Anna; Kikolska, Danuta; Pisarek, Jerzy; Szadkowska, Maria; and Switacz-Tomaszewska, Jadwiga, to Instytut Przemyslu Mleczarskiego. Enzymatic preparation for ripening of milk protein products. 4,158,607, Cl. 195-62.000.
Kallenborn, John, to PPG Industries, Inc. Novel method of cutting of glass strand and product produced thereby. 4,158,555, Cl. 65-2.000.
Kamada, Osamu; Watanabe, Kenzoh; and Sawayama, Shigeru, to Mitsubishi Chemical Industries Ltd.; and Kyoritsu Yuki Co., Ltd. Process for preparing bead polymers. 4,158,726, Cl. 526-200.000.
Kameda, Tamotsu; and Kikuta, Yukio. Fluid jet machine. 4,158,443, Cl. 239-184.000.
Kameyama, Yoshio: *See*—
Honma, Kokichi, deceased; and Kameyama, Yoshio, 4,158,567, Cl. 96-36.300.
Kammerer, Leo P.: *See*—
Fabian, Gordon R.; Kammerer, Leo P.; and Maxedon, Lynn F., 4,158,312, Cl. 74-5.430.
Kanamori, Junichi: *See*—
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Kanebo Limited: *See*—
Kurokawa, Masahiro; and Iwamoto, Hisao, 4,158,359, Cl. 128-630.000.
Kannenberg, Bob G.: *See*—
Anderson, Robert W.; and Kannenberg, Bob G., 4,158,521, Cl. 405-264.000.
Kantner, Donald J.: *See*—
Decker, John J.; and Kantner, Donald J., 4,158,721, Cl. 429-174.000.
Karageozian, Hampar L. Method of producing radioactive technetium-99M. 4,158,700, Cl. 423-2.000.
Karch, John A.: *See*—
Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., 4,158,548, Cl. 44-1.00R.
Kataoka, Takashi: *See*—
Kato, Nobukatsu; Takase, Tsutomu; Morimoto, Yoshio; Kataoka, Takashi; and Hattori, Minoru, 4,158,650, Cl. 260-19.0UA.
Katayama, Tomonori: *See*—
Matsumoto, Masayasu; Iida, Kazuyoshi; Kondo, Yoshikazu; Mizuno, Keiichiro; Nomoto, Sadao; Murayama, Noriaki; Watanabe, Kei; and Katayama, Tomonori, 4,158,401, Cl. 181-210.000.
Kato, Keigo: *See*—
Ando, Masahisa; Kato, Keigo; Yamazaki, Masami; and Kuroiwa, Yosio, 4,158,351, Cl. 123-119.00A.
Kato, Nobukatsu; Takase, Tsutomu; Morimoto, Yoshio; Kataoka, Takashi; and Hattori, Minoru, to Mitsui Toatsu Chemicals, Inc. Process for producing modified phenolic resin. 4,158,650, Cl. 260-19.0UA.
Kattner, Erich: *See*—
Heinzl, Joachim; and Kattner, Erich, 4,158,847, Cl. 346-140.00R.
Katz, Lawrence E.: *See*—
Gavin, David F.; Ardis, Alan E.; Katz, Lawrence E.; and Schellberg, John D., 4,158,660, Cl. 260-308.00B.
Kaun, Thomas D., to United States of America, Energy. Lithium-aluminum-iron electrode composition. 4,158,720, Cl. 428-567.000.
Kawakami, Takaya: *See*—
Miyai, Kozo; Suzuki, Narishige; Kawakami, Takaya; and Kuze, Ikuo, 4,158,641, Cl. 252-301.40F.
Kawase, Yozo; and Fujisaki, Makoto, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of and apparatus for operating pump turbine. 4,158,525, Cl. 415-1.000.
Kay, Spencer, to Nation Wide Manufacturing Co. Miter device. 4,158,320, Cl. 83-425.000.
Kayano, Hideo: *See*—
Yajima, Seishi; Hayashi, Josaburo; Omori, Mamoru; Kayano, Hideo; and Hamano, Masaaki, 4,158,687, Cl. 264-60.000.
Kazami, Koichi: *See*—
Imazeki, Kazuyoshi; and Kazami, Koichi, 4,158,814, Cl. 325-362.000.
Keeling, K. Bailey, Jr., to General Electric Company. Refrigerator having cabinet warming heat transfer device. 4,158,294, Cl. 62-277.000.
Keezer, William J., to Bose Corporation. Dynamic loudspeaker with plastic basket encapsulating front pole plate. 4,158,756, Cl. 179-115.50R.
Kehl, Albin; and Scharf, Friedrich, to Robert Bosch GmbH. Freely suspendable light-transparent heat barrier for window. 4,158,718, Cl. 428-461.000.
Keller, Bruce W.: *See*—
Pruznick, Michael D.; Keller, Bruce W.; Phelps, James R.; Wolfson, Gerald; and Heard, James L., 4,158,838, Cl. 340-750.000.
Keller, Jack L.; and Wiermanski, Jerome J., to General Binding Corporation. Method of producing laminated sheets using laminated pouch support. 4,158,587, Cl. 156-216.000.
Keller, John H.; and McKenna, Charles M., to International Business Machines Corporation. Negative ion extractor for a plasma etching apparatus. 4,158,589, Cl. 156-345.000.
Keller, Joseph R., to AMP Incorporated. Lead frame having integral terminal tabs. 4,158,745, Cl. 174-52.0FP.
Kelly, Charles A.: *See*—
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,158,658, Cl. 260-307.00D.
Kelsey, Arthur L.: *See*—
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Kemter, Heinz: *See*—
Ehedy, Gustav; Kemter, Heinz; Ponitz, Wilfried; Ehrlich, Engelbert; Politze, Walter; Scholtis, Walter; and Wunsch, Wolfgang, 4,158,292, Cl. 66-190.000.
Kennon, Richard E., to Electric Power Research Institute, Inc. Fault current limiter. 4,158,864, Cl. 361-58.000.
Kensrue, Milo M.; and Martin, Donald L. Track guided carriage unit. 4,158,315, Cl. 74-31.000.
Kerbel, Sheldon J., to Hazeltine Corporation. Automatic control of iris and clamping voltage in video signal generator. 4,158,859, Cl. 358-228.000.
Kersting, Arno: *See*—
Schuster, Eberhard; and Kersting, Arno, 4,158,614, Cl. 204-157.10R.
Kewanee Industries, Inc.: *See*—
Hammerel, Richard J., 4,158,644, Cl. 252-547.000.
Kielczynski, Zdzislaw: *See*—
Jasniewicz, Zbigniew; Knyszewski, Jan; Osrodek, Tadeusz; Kielczynski, Zdzislaw; and Stefanski, Lech, 4,158,249, Cl. 17-73.000.
Kikolska, Danuta: *See*—
Kalinowski, Leonard; Frackiewicz, Elzbieta; Janiszewska, Leonarda; Pawlik, Anna; Kikolska, Danuta; Pisarek, Jerzy; Szadkowska, Maria; and Switacz-Tomaszewska, Jadwiga, 4,158,607, Cl. 195-62.000.
Kikuta, Yukio: *See*—
Kameda, Tamotsu; and Kikuta, Yukio, 4,158,443, Cl. 239-184.000.
Kimber, Erich V.; and Ronne, Per-Axel C., to Atlas Copco Aktiebolag. Drill boom with hydraulic parallel motion means. 4,158,393, Cl. 173-2.000.
Kimura, Harutaka; Nozawa, Seiichi; Mukai, Seiichi; and Shikama, Masaharu, to Mitsubishi Chemical Industries Ltd. Process for producing polyoxymethylene. 4,158,729, Cl. 528-238.000.
Kindelspire, Thomas J., to General Electric Company. Relay device. 4,158,828, Cl. 335-156.000.
Kishi, Hirotoshi: *See*—
Hattori, Hiroyuki; Ogawa, Hiroshi; Kishi, Hirotoshi; Umezawa, Kazumi; and Sagara, Seiji, 4,158,499, Cl. 355-8.000.
Kitagawa, Tohru: *See*—
Suzuki, Seiji; Nishiyama, Yoshihisa; and Kitagawa, Tohru, 4,158,396, Cl. 177-210.00R.
Kitaura, Mashio; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Light responsive circuit. 4,158,492, Cl. 354-24.000.
Klawitter, Jerome J.; and Bhatti, Nazir A., to United States of America, Navy. Method of making ceramic prosthetic implant suitable for a knee joint. 4,158,684, Cl. 264-43.000.
Klechka, Ernest W.; and Hemsath, James R., to Standard Oil Company, The. Apparatus for calcining green coke. 4,158,541, Cl. 432-116.000.
Kleiner, Frank; and Muller, Karl H., to Bayer Aktiengesellschaft. Apparatus for the continuous production of continuous plastics foam webs. 4,158,538, Cl. 425-445.000.
Kluge, Andreas: *See*—
Beeck, Udo; and Kluge, Andreas, 4,158,771, Cl. 250-294.000.
Kluy, Werner: *See*—
Birnkraut, Hans-Walter; and Kluy, Werner, 4,158,588, Cl. 156-331.000.
Knight, Charles B.: *See*—
Cooper, Frank W., Jr.; Silverblatt, Bernard L.; Knight, Charles B.; and Berringer, Robert T., 4,158,605, Cl. 176-61.000.
Knodel, Emil: *See*—
Nonnemacher, Gerhard; Knodel, Emil; and Bosch, Paul, 4,158,529, Cl. 417-216.000.
Knoll, Jerry N.: *See*—
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Knopf, Robert J.: *See*—
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Knorr-Bremse GmbH: *See*—
Storzinger, Thomas; Langer, Erich; and Pick, Peter, 4,158,369, Cl. 137-599.200.
Knyszewski, Jan: *See*—
Jasniewicz, Zbigniew; Knyszewski, Jan; Osrodek, Tadeusz; Kielczynski, Zdzislaw; and Stefanski, Lech, 4,158,249, Cl. 17-73.000.

Kobayashi, Naotake: *See*—
Nishimura, Makoto; Naito, Keiichi; Fujiwara, Yoshio; and Kobayashi, Naotake, 4,158,725, Cl. 526-52.100.
Kobayashi, Sumio: *See*—
Sasaki, Kantaro; Kobayashi, Sumio; Sugitani, Yasuo; and Ishimura, Susumu, 4,158,380, Cl. 164-147.000.
Koelsch-Foelger-Werke AK.: *See*—
Butz, Erich, 4,158,576, Cl. 134-7.000.
Koenig, James P., to Bendix Corporation, The. Spring brake hold-off system. 4,158,470, Cl. 303-71.000.
Koleske, Joseph V.; Knopf, Robert J.; and Smith, Oliver W., to Union Carbide Corporation. High solids compositions containing ester diol alkoxylates. 4,158,652, Cl. 260-29.4UA.
Kolobanov, Nikolai I.: *See*—
Onikov, Eduard A.; Galperin, Alexandr L.; Zabotin, Alexandr A.; Loschilin, Evgeny D.; and Kolobanov, Nikolai I., 4,158,373, Cl. 139-436.000.
Komatsu, Noboru; and Arai, Tohru, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method for forming a carbide layer of a Va-Group element of the periodic table or chromium on the surface of a ferrous alloy article. 4,158,578, Cl. 148-6.110.
Kondo, Yoshikazu: *See*—
Matsumoto, Masayasu; Iida, Kazuyoshi; Kondo, Yoshikazu; Mizuno, Keiichiro; Nomoto, Sadao; Murayama, Noriaki; Watanabe, Kei; and Katayama, Tomonori, 4,158,401, Cl. 181-210.000.
Konig, Wilfried: *See*—
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Korsten, Andreas: *See*—
Petersen, Fritz; and Korsten, Andreas, 4,158,744, Cl. 13-25.000.
Kosak, Wolfgang; Werner, Peter; Gerber, Hans; and Hidveghy, Ivan, to Robert Bosch GmbH. Speed setting and control system for universal motors. 4,158,796, Cl. 318-245.000.
Kostelezky, Walter: *See*—
Wuchner, Erwin; Heitmeyer, Ulrich; and Kostelezky, Walter, 4,158,841, Cl. 343-7.0VM.
Kosugi, Makoto, to Nippon Telegraph and Telephone Public Corp. Curve generator for generating a smooth curve with a pair of circular arcs between two given points. 4,158,887, Cl. 364-723.000.
Kotuby, Paul M., to Risdon Manufacturing Company, The. Dispensing system for directing liquid to a defined area. 4,158,361, Cl. 128-173.00R.
Kotylev, Alexandr M.; Gitgarts, Dmitry A.; Ioffe, Jury S.; Prostyakov, Alexandr A.; and Krizental, Viktor I. Method of checking the state of the lining of a melting unit and device for effecting same. 4,158,806, Cl. 324-65.00R.
Kowalski, John A., to Textron Inc. Apparatus of manufacturing fastening element train. 4,158,532, Cl. 425-121.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Kuhnel, Roland, 4,158,603, Cl. 176-38.000.
Schuster, Eberhard; and Kersting, Arno, 4,158,614, Cl. 204-157.10R.
Krause Milling Company: *See*—
Cummisford, Robert G.; Wasielewski, Richard J.; and Krueger, Robert K., 4,158,574, Cl. 127-32.000.
Krause, Robert F.; and Pavlik, Norman M., to Westinghouse Electric Corp. Method of making magnetic component for direct current apparatus. 4,158,581, Cl. 148-105.000.
Krause, Robert F., to Westinghouse Electric Corp. Method of making pressed magnetic core components. 4,158,582, Cl. 148-120.000.
Krauss, Otto, to Luwa AG. Method and apparatus for connecting a yarn and for forming a yarn reserve at a bobbin tube. 4,158,444, Cl. 242-18.0PW.
Krebs, Karl-Friedrich: *See*—
Halpaap, Herbert; Krebs, Karl-Friedrich; and Heinz, Hans, 4,158,626, Cl. 210-31.00C.
Krempp, Stanley G.; and Berger, David J., to United Cabinet Corporation, The. Door arrangement. 4,158,277, Cl. 52-476.000.
Krieger, Karl, to Hermann Hemscheidt Maschinenfabrik, GmbH & Co. Control device. 4,158,326, Cl. 91-508.000.
Krizental, Viktor I.: *See*—
Kotylev, Alexandr M.; Gitgarts, Dmitry A.; Ioffe, Jury S.; Prostyakov, Alexandr A.; and Krizental, Viktor I., 4,158,806, Cl. 324-65.00R.
Kroenke, June E. Universal pressing ham support. 4,158,265, Cl. 38-135.000.
Krueger, Robert K.: *See*—
Cummisford, Robert G.; Wasielewski, Richard J.; and Krueger, Robert K., 4,158,574, Cl. 127-32.000.
Krugener, Rolf: *See*—
Grabner, Christian; Krugener, Rolf; and Kurth, Hermann W., 4,158,299, Cl. 70-224.000.
Kruger, Franz-Josef: *See*—
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Kucera, Thomas J.: *See*—
Amariti, Luigi; Juskey, John S.; Azari, Shapoor; and Kucera, Thomas J., 4,158,634, Cl. 252-62.10P.
Kuchler, Jakob: *See*—
Cardinale, Raffaele; and Kuchler, Jakob, 4,158,278, Cl. 52-790.000.
Kuchy, Ray W., to Bendix Corporation, The. Automatic direction finder antenna preamplifier processor. 4,158,843, Cl. 343-113.00R.
Kuhl, Peter J.: *See*—
Clarke, Robert A.; Kuhl, Peter J.; and Paschke, Richard H., 4,158,584, Cl. 156-73.100.
Kuhnel, Roland, to Kraftwerk Union Aktiengesellschaft. Blow-off device for limiting excess pressure in nuclear power plants, especially in boiling-water nuclear power plants. 4,158,603, Cl. 176-38.000.
Kunioka, Kazuo; Noguchi, Takao; and Sudo, Tomoshige, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for heat treatment of metal member. 4,158,758, Cl. 219-10.430.
Kuny, Wilhelm; and Langecker, Karl, to Siemens Aktiengesellschaft. Transducer electrodes for filter or delay lines utilizing surface waves. 4,158,823, Cl. 333-151.000.
Kupperman, Dennis: *See*—
Kupperman, Sam; and Kupperman, Dennis, 4,158,257, Cl. 33-25.00R.
Kupperman, Sam; and Kupperman, Dennis, to RB Toy Development Co. Pantograph integrally formed or molded of plastic material. 4,158,257, Cl. 33-25.00R.
Kuroi, Hisashi; Hatada, Masamichi; Morita, Kumio; and Tanaka, Eiji, to Kuroi Kosan Kabushiki Kaisha. Light control device for high frequency lighted fluorescent lamp. 4,158,792, Cl. 315-86.000.
Kuroi Kosan Kabushiki Kaisha: *See*—
Kuroi, Hisashi; Hatada, Masamichi; Morita, Kumio; and Tanaka, Eiji, 4,158,792, Cl. 315-86.000.
Kuroiwa, Yosio: *See*—
Ando, Masahisa; Kato, Keigo; Yamazaki, Masami; and Kuroiwa, Yosio, 4,158,351, Cl. 123-119.00A.
Kurokawa, Masahiro; and Iwamoto, Hisao, to Kanebo Limited. Device for testing influence of medicinal or cosmetic substance on skin. 4,158,359, Cl. 128-630.000.
Kurth, Hermann W.: *See*—
Grabner, Christian; Krugener, Rolf; and Kurth, Hermann W., 4,158,299, Cl. 70-224.000.
Kuze, Ikuo: *See*—
Miyai, Kozo; Suzuki, Narishige; Kawakami, Takaya; and Kuze, Ikuo, 4,158,641, Cl. 252-301.40F.
Kyoei Zoki Kabushiki Kaisha: *See*—
Hayashi, Takeshi, 4,158,418, Cl. 414-440.000.
Kyoritsu Yuki Co., Ltd.: *See*—
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Kay, Spencer, 4,158,320, Cl. 83-425.000.

National Distillers and Chemical Corp.: *See—*
Bartsch, Raymond C., 4,158,737, Cl. 560-245.000.

National Starch and Chemical Corporation: *See—*
Pastor, Stephen D., 4,158,618, Cl. 204-159.160.

Naussac, Francois J.: *See—*
de Ponteves, Dominique; Naussac, Francois J.; and Dujols, Andre, 4,158,504, Cl. 356-247.000.

Navarro, Felipe: *See—*
Gottschalk, Robert E.; Navarro, Felipe; and Fazekas, Carl F., 4,158,488, Cl. 352-243.000.
Gottschalk, Robert E.; Navarro, Felipe; and Fazekas, Carl F., 4,158,489, Cl. 352-243.000.
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Navi, Menashe, to ANPA Research Institute. Inking baffle for rotary newspaper presses. 4,158,333, Cl. 101-363.000.

Naylor, Thomas K., to American Optical Corporation. Input overload protection circuit. 4,158,863, Cl. 361-56.000.

NCR Corporation: *See—*
Jahelka, James R.; and Bemis, Edward D., 4,158,800, Cl. 318-685.000.

Nelson, Norvell J., to Varian Associates, Inc. Silicon nitride film and method of deposition. 4,158,717, Cl. 428-446.000.

Neptune Eastech, Inc.: *See—*
Lerner, Daniel M., 4,158,818, Cl. 328-167.000.

Neuberger, Wayne K., to Boeing Company, The. Guidance-light display apparatus and method for in-flight link-up of two aircraft. 4,158,885, Cl. 364-460.000.

Newbegin, Everett H., to SER Co. Apparatus for continuous winding of weighed quantity of yarn. 4,158,445, Cl. 242-39.000.

Newell, P. Bruce: *See—*
Morris, James C.; Newell, P. Bruce; and Scholz, John A., 4,158,878, Cl. 362-3.000.

Nielsen, Leif, to Danfoss A/S. Thermostatic expansion valve for refrigeration plants. 4,158,437, Cl. 236-92.00B.

Nilsson, Ingvar E., to Tetra Pak Developpement SA. Method for the treatment of rigid plastic containers. 4,158,692, Cl. 264-320.000.

Nippon Electric Co., Ltd.: *See—*
Miura, Tetsuo; and Nishijima, Yasuo, 4,158,835, Cl. 340-146.30H.
Monden, Hiroshi, 4,158,889, Cl. 364-753.000.
Sakoe, Hiroaki; and Chiba, Seibi, 4,158,750, Cl. 179-1.0SD.
Tajima, Tsuneaki; and Matsuo, Yohichi, 4,158,875, Cl. 361-384.000.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
Goi, Mitsuhiro; Miyashita, Masahiko; and Hashimoto, Tokio, 4,158,741, Cl. 562-599.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Kunioka, Kazuo; Noguchi, Takao; and Sudo, Tomoshige, 4,158,758, Cl. 219-10.430.

Nippon Telegraph and Telephone Public Corp.: *See—*
Kosugi, Makoto, 4,158,887, Cl. 364-723.000.

Nishida, Yasuhiro: *See—*
Akai, Shin-ichi; Nishida, Yasuhiro; and Fujita, Keiichiro, 4,158,851, Cl. 357-63.000.

Nishijima, Yasuo: *See—*
Miura, Tetsuo; and Nishijima, Yasuo, 4,158,835, Cl. 340-146.30H.

Nishimura, Makoto; Naito, Keiichi; Fujiwara, Yoshio; and Kobayashi, Naotake, to Sony Corporation. Method of manufacturing an adhesive. 4,158,725, Cl. 526-52.100.

Nishiyama, Mitsuru, to Sharp Kabushiki Kaisha. Reflective type liquid crystal display. 4,158,484, Cl. 350-338.000.

Nishiyama, Yoshihisa: *See—*
Suzuki, Seiji; Nishiyama, Yoshihisa; and Kitagawa, Tohru, 4,158,396, Cl. 177-210.00R.

Nissan Motor Company, Limited: *See—*
Yamashita, Sinobu; and Takahashi, Kotei, 4,158,404, Cl. 192-3.580.

Nixdorf Computer AG: *See—*
Holland-Letz, Guenter, 4,158,456, Cl. 271-118.000.

Noblanc, Alain G. N.; and Valenchon, Claude P., to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris". Platforms resting on an underwater structure. 4,158,516, Cl. 405-196.000.

Noguchi, Takao: *See—*
Kunioka, Kazuo; Noguchi, Takao; and Sudo, Tomoshige, 4,158,758, Cl. 219-10.430.

Nolan, Richard A., to RCA Corporation. Implosion protected CRT. 4,158,419, Cl. 220-2.10A.

Nomoto, Sadao: *See—*
Matsumoto, Masayasu; Iida, Kazuyoshi; Kondo, Yoshikazu; Mizuno, Keiichiro; Nomoto, Sadao; Murayama, Noriaki; Watanabe, Kei; and Katayama, Tomonori, 4,158,401, Cl. 181-210.000.

Nonnemacher, Gerhard; Knodel, Emil; and Bosch, Paul, to Robert Bosch GmbH. Control device for a pumping arrangement. 4,158,529, Cl. 417-216.000.

Nord, Eric T., to Nordson Corporation. Coater. 4,158,343, Cl. 118-315.000.

Nordson Corporation: *See—*
Nord, Eric T., 4,158,343, Cl. 118-315.000.

North American Philips Corporation: *See—*
Ragan, Randall C., 4,158,831, Cl. 338-174.000.

Northern Telecom Limited: *See—*
Taylor, David W.; and Waucheul, Jean P., 4,158,746, Cl. 174-112.000.

Novak, William P., to Bicron Corporation. Shock-resistant scintillation detector. 4,158,773, Cl. 250-361.00R.

Novatny, Donald F., to Boise Cascade Corporation. Container blank including binding strap tabs. 4,158,410, Cl. 206-527.000.

Nozawa, Seiichi: *See—*
Kimura, Harutaka; Nozawa, Seiichi; Mukai, Seiichi; and Shikama, Masaharu, 4,158,729, Cl. 528-238.000.

Nuclear Power Company (Whetstone) Limited: *See—*
Cook, Reginald K.; and George, Brian V., 4,158,604, Cl. 176-60.000.

Nuovo Pignone, Divisione Smit: *See—*
Onikov, Eduard A.; Galperin, Alexandr L.; Zabotin, Alexandr A.; Loschilin, Evgeny D.; and Kolobanov, Nikolai I., 4,158,373, Cl. 139-436.000.

N.V. Optische Industrie "De Oude Delft": *See—*
Duinker, Simon, 4,158,854, Cl. 358-111.000.

N.V. Weefautomaten Picanol: *See—*
Van Dijck, Frans S., 4,158,372, Cl. 139-370.100.

Oborsh, Edward V.: *See—*
Ernst, Thomas J.; Oborsh, Edward V.; and Oreel, Foppe E., 4,158,706, Cl. 426-327.000.

Oddo, Eugene P.: *See—*
Seelenbinder, Terry G.; Hudson, Walter A.; and Oddo, Eugene P., 4,158,495, Cl. 354-318.000.

Odrobina, Stanislaw: *See—*
Biolik, Felicjan; Gurgul, Franciszek; Odrobina, Stanislaw; Morys, Zygmunt; Wieczorek, Alfons; Wydmanski, Zenon; and Gawlowski, Piotr, 4,158,743, Cl. 13-25.000.

Ogawa, Hiroshi: *See—*
Hattori, Hiroyuki; Ogawa, Hiroshi; Kishi, Hirotoshi; Umezawa, Kazumi; and Sagara, Seiji, 4,158,499, Cl. 355-8.000.

Ohmori, Hitoshi, to Rank Xerox Limited. Blade cleaning system for a reproducing apparatus. 4,158,498, Cl. 355-15.000.

Ohmori, Koichiro, to Honshyuseishi Kabushiki Kaishya. Apparatus for feeding elongate sheet materials. 4,158,429, Cl. 226-34.000.

Okura Kogyo Kabushiki Kaisha: *See—*
Matsuda, Hideaki, 4,158,727, Cl. 528-92.000.

Okuyama, Katsuo: *See—*
Yonezaki, Jimpachi; Takahashi, Yoshihiro; Shimada, Toshihiko; and Okuyama, Katsuo, 4,158,754, Cl. 179-98.000.

Olin Corporation: *See—*
Dever, Gerald V., Jr., 4,158,535, Cl. 425-145.000.
Gavin, David F.; Ardis, Alan E.; Katz, Lawrence E.; and Schellberg, John D., 4,158,660, Cl. 260-308.00B.
Yarwood, John C.; Yun, Ik Y.; and Tyler, Derek E., 4,158,379, Cl. 164-49.000.

O'Loughlin, Francis A., to Thomas & Betts Corporation. Tool with full-stroke compelling mechanism. 4,158,302, Cl. 72-409.000.

Olschewski, Armin: *See—*
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,158,394, Cl. 175-228.000.

Olsen, Donald G.; and Masi, Nicholas, to Crown Optical Company, Inc. Method of blocking plastic lenses for surfacing. 4,158,273, Cl. 51-284.00R.

Olympus Optical Company Ltd.: *See—*
Sato, Masaaki, 4,158,865, Cl. 360-73.000.

Omori, Mamoru: *See—*
Yajima, Seishi; Hayashi, Josaburo; Omori, Mamoru; Kayano, Hideo; and Hamano, Masaaki, 4,158,687, Cl. 264-60.000.

Onikov, Eduard A.; Galperin, Alexandr L.; Zabotin, Alexandr A.; Loschilin, Evgeny D.; and Kolobanov, Nikolai I., to Tsentralny Nauchno-Issledovatelsky Institut Khlopchatobumazhnoi Promyshlennosti; and Nuovo Pignone, Divisione Smit. Method of and apparatus for threading the weft thread carriers in travelling-wave looms. 4,158,373, Cl. 139-436.000.

Onopchenko, Anatoli: *See—*
Schulz, Johann G. D.; and Onopchenko, Anatoli, 4,158,739, Cl. 562-543.000.

Oreel, Foppe E.: *See—*
Ernst, Thomas J.; Oborsh, Edward V.; and Oreel, Foppe E., 4,158,706, Cl. 426-327.000.

Orlowski, Jan A. Cleaner for grain and suede leather. 4,158,543, Cl. 8-137.000.

Orr, Richard S.: *See—*
Andrews, Harry N.; and Orr, Richard S., 4,158,599, Cl. 176-30.000.

Orth, Joy H. Audio-visual teaching apparatus. 4,158,264, Cl. 35-35.00C.

Osborne, Thomas E.: *See—*
Heinsen, Edward A.; Marion, Andre F.; and Osborne, Thomas E., 4,158,285, Cl. 58-23.00R.

Osburn, Michael R., to United States of America, Navy. Safe/arm firing device. 4,158,334, Cl. 102-16.000.
Osrodek, Tadeusz: *See*—
Jasniewicz, Zbigniew; Knyszewski, Jan; Osrodek, Tadeusz; Kielczynski, Zdzislaw; and Stefanski, Lech, 4,158,249, Cl. 17-73.000.
Ostrowsky, Daniel: *See*—
D'Auria, Luigi; Ostrowsky, Daniel; and Jacques, Andre, 4,158,478, Cl. 350-96.230.
Oude Alink, Bernardus A.; and Thompson, Neil E. S., to Petrolite Corporation. Substituted pyridines. 4,158,734, Cl. 546-251.000.
Outboard Marine Corporation: *See*—
Clements, Boyd D., 4,158,391, Cl. 172-22.000.
Owen, Harrold D.; and Rosenthal, Wayne O., to Pengo Industries, Inc. Method of and apparatus for squeeze cementing in boreholes. 4,158,388, Cl. 166-286.000.
Oxenreider, Terry; Duesterhoeft, Donald A.; and Erb, Edgar M., to General Battery Corporation. Apparatus for casting lead into plastic for side terminal batteries. 4,158,382, Cl. 164-305.000.
P. R. Mallory & Co. Inc.: *See*—
Sandler, Louis M., 4,158,794, Cl. 315-169.100.
Pall Corporation: *See*—
Sun, Cedric; and Roach, Charles J., 4,158,449, Cl. 244-136.000.
Palmer, Michael C. Mobile cleaning unit. 4,158,248, Cl. 15-321.000.
Panavision, Incorporated: *See*—
Gottschalk, Robert E.; Navarro, Felipe; and Fazekas, Carl F., 4,158,488, Cl. 352-243.000.
Gottschalk, Robert E.; Navarro, Felipe; and Fazekas, Carl F., 4,158,489, Cl. 352-243.000.
Gottschalk, Robert E.; Navarro, Felipe; and Fazekas, Carl F., 4,158,490, Cl. 352-243.000.
Panelo, Alfredo A.: *See*—
Simmons, David H.; and Panelo, Alfredo A., 4,158,881, Cl. 363-25.000.
Pantelides, Antis: *See*—
Ford, Geoffrey E.; Pantelides, Antis; and Willsmer, Trevor R., 4,158,624, Cl. 209-523.000.
Papay, Andrew G., to Edwin Cooper, Inc. Lubricating oil. 4,158,633, Cl. 252-32.70E.
Park Chemical Company: *See*—
Foreman, Robert W.; and Dubal, Gajen P., 4,158,579, Cl. 148-20.000.
Paschke, Richard H.: *See*—
Clarke, Robert A.; Kuhl, Peter J.; and Paschke, Richard H., 4,158,584, Cl. 156-73.100.
Pastor, Stephen D., to National Starch and Chemical Corporation. Actinic-radiation curable polymers prepared from a reactive polymer, halogenated cyclic anhydride and glycidyl ester. 4,158,618, Cl. 204-159.160.
Paul Journee, S.A.: *See*—
Journee, Maurice A., 4,158,513, Cl. 403-316.000.
Pavlik, Norman M.; and Sefko, John, to Westinghouse Electric Corp. Method for preparing oxide coated microlamination particles. 4,158,561, Cl. 75-0.5BA.
Pavlik, Norman M.: *See*—
Krause, Robert F.; and Pavlik, Norman M., 4,158,581, Cl. 148-105.000.
Reynolds, William T.; and Pavlik, Norman M., 4,158,580, Cl. 148-104.000.
Pawlak, Kenneth E.: *See*—
Durrett, Andrew M.; and Pawlak, Kenneth E., 4,158,362, Cl. 128-272.000.
Pawlik, Anna: *See*—
Kalinowski, Leonard; Frackiewicz, Elzbieta; Janiszewska, Leonarda; Pawlik, Anna; Kikolska, Danuta; Pisarek, Jerzy; Szadkowska, Maria; and Switacz-Tomaszewska, Jadwiga, 4,158,607, Cl. 195-62.000.
Pearson, Charles J.; and Saracsan, Jeffrey W., to Goodyear Tire & Rubber Company, The. Tire having polyurethane laminate thereon. 4,158,378, Cl. 152-353.00R.
Pedro, Alfred J., to Carl Pedro and Sons, Inc. Circuit board holder. 4,158,876, Cl. 361-415.000.
Pelletier, Raymond G.: *See*—
Sullivan, Paul F.; Moore, Randall W.; Hottel, Hoyt C., Jr.; Pelletier, Raymond G.; Gobush, William; and Lynch, Francis deS., 4,158,853, Cl. 358-93.000.
Pengo Industries, Inc.: *See*—
Owen, Harrold D.; and Rosenthal, Wayne O., 4,158,388, Cl. 166-286.000.
Pennzoil Company: *See*—
Thompson, William H.; Worthington, Ralph E.; and Somers, Thomas N., 4,158,558, Cl. 71-34.000.
Peter, Oskar E. Impact or shock absorbing device for automobile seat belts. 4,158,403, Cl. 188-1.00C.
Petersen, Christian C., to Polaroid Corporation. Flip flash having final flash signal. 4,158,879, Cl. 362-13.000.
Petersen, Fritz; and Korsten, Andreas, to Elektroschmelzwerk Kempten GmbH. Electrical resistance furnace for the production of silicon carbide. 4,158,744, Cl. 13-25.000.
Peterson, Glen; and Fearon, Robert E. Method of and apparatus for securing and storing personal information. 4,158,433, Cl. 235-380.000.
Peterson, Glen. Electronic status determining system for goods. 4,158,434, Cl. 235-382.000.
Peterson, Sven T., to Telefonaktiebolaget L M Ericsson. Connecting and supporting clamp for two adjacently situated printed circuit cards. 4,158,877, Cl. 361-412.000.
Petrolite Corporation: *See*—
Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,158,734, Cl. 546-251.000.
Pett, Robert A.; Qaderi, S. Burhan A.; and Tabar, Ronald J., to Ford Motor Company. Sacrificial binders for molding particulate solids and the molding thereof. 4,158,688, Cl. 264-63.000.
Pett, Robert A.; Rao, V. Durga Nageswar; and Qaderi, S. Burhan A., to Ford Motor Company. Molding particulate solids and sacrificial binders therefor. 4,158,689, Cl. 264-63.000.
Pettersson, Bengt E., to Sunds Aktiebolag. Bleaching tower for gas phase bleaching. 4,158,597, Cl. 162-238.000.
Phelps, James R.: *See*—
Pruznick, Michael D.; Keller, Bruce W.; Phelps, James R.; Wolfson, Gerald; and Heard, James L., 4,158,838, Cl. 340-750.000.
Phillips, Michael J.; and Archer, John D., to Internatonal Standard Electric Corporation. Optical fiber splice. 4,158,477, Cl. 350-96.210.
Phillips Petroleum Company: *See*—
Brady, Donnie G., 4,158,655, Cl. 260-45.75B.
Moczygemba, George A.; and South, Aubrey, Jr., 4,158,654, Cl. 260-40.00R.
Reusser, Robert E.; Gray, Lew T.; and Marrs, Oren L., 4,158,371, Cl. 138-145.000.
Tomaja, David L., 4,158,616, Cl. 204-157.10R.
Pick, Peter: *See*—
Storzinger, Thomas; Langer, Erich; and Pick, Peter, 4,158,369, Cl. 137-599.200.
Pickard, George L.: *See*—
Arends, Albert W.; Pickard, George L.; West, G. Allan; and Russell, Edward J., 4,158,539, Cl. 425-451.400.
Pinson, George T., to Boeing Company, The. Non-gimbaled pointer and tracking platform assembly. 4,158,845, Cl. 343-759.000.
Pisarek, Jerzy: *See*—
Kalinowski, Leonard; Frackiewicz, Elzbieta; Janiszewska, Leonarda; Pawlik, Anna; Kikolska, Danuta; Pisarek, Jerzy; Szadkowska, Maria; and Switacz-Tomaszewska, Jadwiga, 4,158,607, Cl. 195-62.000.
Podesta, Sergio, to Container Cargo Carriers Corporation. System for handling container cargo and a novel ship and lifting device. 4,158,416, Cl. 414-139.000.
Polaroid Corporation: *See*—
Petersen, Christian C., 4,158,879, Cl. 362-13.000.
Politechnika Slaska im. Wincentego Pstrowskiego: *See*—
Gierek, Adam; Bajka, Lech; and Adamczyk, Danuta, 4,158,710, Cl. 427-310.000.
Polito, Alan J., to Beckman Instruments, Inc. T3 uptake test employing covalently bound bovine serum albumin. 4,158,703, Cl. 424-1.000.
Politze, Walter: *See*—
Ehedy, Gustav; Kemter, Heinz; Ponitz, Wilfried; Ehrlich, Engelbert; Politze, Walter; Scholtis, Walter; and Wunsch, Wolfgang, 4,158,292, Cl. 66-190.000.
Pollack, Benjamin D.: *See*—
Benger, Richard T.; and Pollack, Benjamin D. (said Richard T. Benger assors. to), 4,158,260, Cl. 33-272.000.
Ponitz, Wilfried: *See*—
Ehedy, Gustav; Kemter, Heinz; Ponitz, Wilfried; Ehrlich, Engelbert; Politze, Walter; Scholtis, Walter; and Wunsch, Wolfgang, 4,158,292, Cl. 66-190.000.
Potage, Jean: *See*—
Deman, Pierre; and Potage, Jean, 4,158,749, Cl. 179-1.0SC.
Potter, Stephen E., to Imperial Chemical Industries Limited. Manufacture of halogenated compounds. 4,158,675, Cl. 260-653.700.
Powell Magnetic Industries, Inc.: *See*—
Drobniak, Joseph M., 4,158,839, Cl. 340-524.000.
PPG Industries, Inc.: *See*—
Drummond, Warren W., 4,158,557, Cl. 65-2.000.
Irwin, Robert G., 4,158,570, Cl. 106-106.000.
Kallenborn, John, 4,158,555, Cl. 65-2.000.
Miller, Richard G.; and Cavitt, Roy L., 4,158,716, Cl. 428-427.000.
Prebensen, Soren P., to Atlas Copco Aktiebolag. Rock bolting apparatus. 4,158,520, Cl. 405-260.000.
Pressman, Gerald L.: *See*—
Gardiner, Kenneth W.; and Pressman, Gerald L., 4,158,564, Cl. 96-1.00R.
Price, Charles R.; Hines, Jimmy J.; and Howell, Ronald L., to J. M. Huber Corporation. Control of carbon black densification. 4,158,682, Cl. 264-40.400.
Price, Charles R.; Hines, Jimmy J.; and Howell, Ronald L., to J. M. Huber Corporation. Control of carbon black densification. 4,158,690, Cl. 264-115.000.
Price, John J., Jr., to Motorola, Inc. I^2L interface with external inputs and method thereof. 4,158,782, Cl. 307-213.000.
Product Development Associates: *See*—
Ciuffetti, Salvatore D., 4,158,374, Cl. 141-392.000.
Prohaska, Hans: *See*—
Hanselmann, Dieter; Prohaska, Hans; and Schubert, Karl-Friedrich, 4,158,247, Cl. 15-250.300.
Projects in Health, Inc.: *See*—
Adams, Jim M., 4,158,360, Cl. 128-725.000.
Prontor-Werk Alfred Gauthier GmbH: *See*—
Rommel, Werner; and Starp, Franz, 4,158,779, Cl. 250-515.000.
Prostyakov, Alexandr A.: *See*—
Kotylev, Alexandr M.; Gitgarts, Dmitry A.; Ioffe, Jury S.; Prostyakov, Alexandr A.; and Krizental, Viktor I., 4,158,806, Cl. 324-65.00R.

Pruznick, Michael D.; Keller, Bruce W.; Phelps, James R.; Wolfson, Gerald; and Heard, James L., to Hughes Aircraft Company. In-raster symbol smoothing system. 4,158,838, Cl. 340-750.000.
Przedsiebiorstwo Polowow Dalekomorskich I Uslug Rybackich "Dalmor": *See*—
Jasniewicz, Zbigniew; Knyszewski, Jan; Osrodek, Tadeusz; Kielczynski, Zdzislaw; and Stefanski, Lech, 4,158,249, Cl. 17-73.000.
Puddington, Ira E.: *See*—
Meadus, Frederick W.; Puddington, Ira E.; and Sparks, Bryan D., 4,158,648, Cl. 260-15.000.
Purex Corporation: *See*—
Townsend, Robert L., 4,158,575, Cl. 134-6.000.
Qaderi, S. Burhan A.: *See*—
Pett, Robert A.; Qaderi, S. Burhan A.; and Tabar, Ronald J., 4,158,688, Cl. 264-63.000.
Pett, Robert A.; Rao, V. Durga Nageswar; and Qaderi, S. Burhan A., 4,158,689, Cl. 264-63.000.
Radtke, Joseph D.: *See*—
Wielebski, Wayne H.; and Radtke, Joseph D., 4,158,836, Cl. 340-309.100.
Ragan, Randall C., to North American Philips Corporation. Single turn potentiometer with helical coil spring wiper. 4,158,831, Cl. 338-174.000.
Ralston Purina Company: *See*—
Ernst, Thomas J.; Oborsh, Edward V.; and Oreel, Foppe E., 4,158,706, Cl. 426-327.000.
Ramsay, H. Allen. Insect deflector for automotive vehicles. 4,158,466, Cl. 296-91.000.
Ramseier & Jenzer AG, Carosseriewerke Bern: *See*—
Fenner, Hans; Auwarter, Wilhelm; and Stark, Karl-Heinz, 4,158,465, Cl. 296-193.000.
Ramspeck, Klaus: *See*—
Hoffmann, Gunter; and Ramspeck, Klaus, 4,158,459, Cl. 274-23.00R.
Rank Xerox Limited: *See*—
Ohmori, Hitoshi, 4,158,498, Cl. 355-15.000.
Rao, M. Vikram: *See*—
Hebbar, Ranna K.; Rao, M. Vikram; and Foerster, George S., 4,158,563, Cl. 75-166.00C.
Rao, V. Durga Nageswar: *See*—
Pett, Robert A.; Rao, V. Durga Nageswar; and Qaderi, S. Burhan A., 4,158,689, Cl. 264-63.000.
Rathmayr, Heinz, to Friedmann & Maier Aktiengesellschaft. Fuel injection device. 4,158,442, Cl. 239-88.000.
Rave, Terence W., to Hercules Incorporated. Preparation of hydrophilic styrene maleic anhydride copolymer fibers for use in papermaking. 4,158,595, Cl. 162-157.00R.
Rayfield, John F. Apparatus for coupling the components of a heat pump system. 4,158,383, Cl. 165-11.000.
Raytheon Company: *See*—
Bowen, Robert F.; and Derby, Palmer P., 4,158,464, Cl. 294-31.200.
Bowen, Robert F.; Freedman, George; Teich, Wesley W.; Martel, Thomas J.; and Eves, E. Eugene, II, 4,158,760, Cl. 219-10.55E.
Davis, Luther, Jr.; and Barrett, Harrison H., 4,158,770, Cl. 250-272.000.
Hapgood, William H., 4,158,386, Cl. 165-48.00R.
Hapgood, William H., 4,158,438, Cl. 237-7.000.
Shapiro, Gerald N.; Goldstone, Bertram J.; Simone, Joseph D.; and Spignese, Edward E., 4,158,888, Cl. 364-726.000.
Rb Toy Development Co.: *See*—
Kupperman, Sam; and Kupperman, Dennis, 4,158,257, Cl. 33-25.00R.
RCA Corporation: *See*—
Curtice, Walter R., 4,158,784, Cl. 307-260.000.
Goldman, Abraham, 4,158,566, Cl. 96-36.200.
Harlan, Wayne E., 4,158,852, Cl. 358-35.000.
Harwylo, Frank Z., 4,158,849, Cl. 357-16.000.
Nolan, Richard A., 4,158,419, Cl. 220-2.10A.
Thomas, Robert G.; and Sadashige, Koichi, 4,158,855, Cl. 358-127.000.
Wine, Charles M., 4,158,815, Cl. 325-455.000.
Wine, Charles M., 4,158,816, Cl. 325-464.000.
Readio, Philip D.; and Allan, John L. H., to Dart Industries Inc. Dissolution of metals utilizing a H_2O_2-sulfuric acid solution catalyzed with ketone compounds. 4,158,592, Cl. 156-666.000.
Readio, Philip D.: *See*—
Allan, John L. H.; and Readio, Philip D., 4,158,593, Cl. 156-666.000.
Recognition Equipment Incorporated: *See*—
Himmel, David P., 4,158,507, Cl. 356-376.000.
Reed, Charles C.; Cooley, Denton A.; and Sharp, Russell G., to Texas Medical Products, Inc. Blood oxygenator. 4,158,693, Cl. 422-46.000.
Reedy, Charles E., to ACF Industries, Incorporated. Bottom operable tank car valve. 4,158,453, Cl. 251-144.000.
Reedy, Gerald T., to United States of America, Energy. Device for collecting and analyzing matrix-isolated samples. 4,158,772, Cl. 250-338.000.
Regie Nationale des Usines Renault: *See*—
Cherbourg, Robert; Falluel, Jean-Pierre; and Menard, Michel, 4,158,270, Cl. 49-103.000.
Reichert, Gilbert A.; and Trendel, Dennis J., to Allen-Bradley Company. Enclosure seal. 4,158,757, Cl. 200-302.000.
Reinberg, Alan R., to Texas Instruments Incorporated. Horologic instruments with random timing source. 4,158,286, Cl. 58-23.00C.
Reliable Electric Company: *See*—
Gilberts, Alexander G., 4,158,869, Cl. 361-118.000.
Research Corporation: *See*—
Malley, Arthur, 4,158,705, Cl. 424-91.000.
Research Institute For Iron, Steel and Other Metals of the Tohoku University, The: *See*—
Yajima, Seishi; Hayashi, Josaburo; Omori, Mamoru; Kayano, Hideo; and Hamano, Masaaki, 4,158,687, Cl. 264-60.000.
Rest, Frederick G. Journal guard. 4,158,407, Cl. 206-318.000.
Retzlaff, Guenter: *See*—
Stubenrauch, Gerd; Hamprecht, Gerhard; Wuerzer, Bruno; and Retzlaff, Guenter, 4,158,559, Cl. 71-91.000.
Reusser, Robert E.; Gray, Lew T.; and Marrs, Oren L., to Phillips Petroleum Company. Asphalt and rubber comprising composition. 4,158,371, Cl. 138-145.000.
Revlon Inc.: *See*—
Baer, Ronald W.; and Goldberg, Marvin E., 4,158,704, Cl. 424-72.000.
Reynolds, Elizabeth H.: *See*—
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., 4,158,621, Cl. 208-114.000.
Reynolds, Richard F. Basic cyclecar frame. 4,158,397, Cl. 180-25.00A.
Reynolds, William T.; and Pavlik, Norman M., to Westinghouse Electric Corp. Method of making pressed magnetic core components. 4,158,580, Cl. 148-104.000.
Rheinfrank, Lamson, Jr.: *See*—
Bundy, Richard P.; Zumsteg, D. Bruce; and Rheinfrank, Lamson, Jr., 4,158,554, Cl. 55-379.000.
Rial, Elio: *See*—
Brichta, Corrado; Tettamanzi, Natale; and Rial, Elio, 4,158,714, Cl. 428-391.000.
Ribka, Joachim: *See*—
Muller, Rolf; Ribka, Joachim; and Tappe, Horst, 4,158,670, Cl. 260-456.00A.
Rickards, Michael A., to Rohr Industries, Inc. Stern seal anti-flooding apparatus. 4,158,399, Cl. 180-127.000.
Ricoh Co., Ltd.: *See*—
Ishima, Kazumi, 4,158,848, Cl. 346-155.000.
Suzuki, Shigeru; and Tani, Tatsuo, 4,158,497, Cl. 355-8.000.
Riddel, John W., to General Motors Corporation. Dump valve assembly. 4,158,398, Cl. 180-108.000.
Ridson Manufacturing Company, The: *See*—
Sullivan, William E.; and Meetze, Murray O., Jr., 4,158,440, Cl. 239-1.000.
Rieder, Heinz; and Schwaiger, Max. Instrument for measuring lengths. 4,158,509, Cl. 356-395.000.
Riegelman, Harry M., to Rusco Industries, Inc. Vehicle window with non-removable sash in curved frame. 4,158,272, Cl. 49-431.000.
Ringwald, Arthur. Binding device. 4,158,250, Cl. 24-16.00R.
Risdon Manufacturing Company, The: *See*—
Kotuby, Paul M., 4,158,361, Cl. 128-173.00R.
Risser, Roger L.; Kelsey, Arthur L.; and Stiefvater, Thomas L., to Sperry Rand Corporation. Feed material handling apparatus. 4,158,469, Cl. 406-89.000.
Roach, Charles J.: *See*—
Sun, Cedric; and Roach, Charles J., 4,158,449, Cl. 244-136.000.
Robert Bosch GmbH: *See*—
Kehl, Albin; and Scharf, Friedrich, 4,158,718, Cl. 428-461.000.
Kosak, Wolfgang; Werner, Peter; Gerber, Hans; and Hidveghy, Ivan, 4,158,796, Cl. 318-245.000.
Moller, Heinz; and Wahl, Josef, 4,158,350, Cl. 123-117.00R.
Nonnemacher, Gerhard; Knodel, Emil; and Bosch, Paul, 4,158,529, Cl. 417-216.000.
Roberts, Charles G.; and DeMichele, Ernest, to Mectronic, Inc. Engine efficiency unit. 4,158,346, Cl. 123-1.00R.
Robinet, Jules P.: *See*—
Balkwill, G. Russell; Robinet, Jules P.; and Tamasovics, John F., 4,158,420, Cl. 220-3.300.
Rockwell International Corporation: *See*—
Fabian, Gordon R.; Kammerer, Leo P.; and Maxedon, Lynn F., 4,158,312, Cl. 74-5.430.
Rohm and Haas Company: *See*—
Lewis, Sheldon N.; and Haggard, Richard A., 4,158,736, Cl. 560-205.000.
Rohr Industries, Inc.: *See*—
Rickards, Michael A., 4,158,399, Cl. 180-127.000.
Roland Offsetmaschinenfabrik Faber & Schleicher AG.: *See*—
Cappel, Bert; and Dorn, Alfred, 4,158,799, Cl. 318-626.000.
Rollei-Werke Franke & Heidecke: *See*—
Mielke, Bodo, 4,158,494, Cl. 354-202.000.
Romans, Orville. Motorcycle chainguard and lubricator. 4,158,402, Cl. 184-15.00R.
Rommel, Werner; and Starp, Franz, to Prontor-Werk Alfred Gauthier GmbH. X-ray shield. 4,158,779, Cl. 250-515.000.
Ronne, Per-Axel C.: *See*—
Kimber, Erich V.; and Ronne, Per-Axel C., 4,158,393, Cl. 173-2.000.
Rose, William R., II. Rechargeable battery powered electric car and recharging station therefor. 4,158,802, Cl. 320-2.000.
Rosenthal, Wayne O.: *See*—
Owen, Harrold D.; and Rosenthal, Wayne O., 4,158,388, Cl. 166-286.000.
Ross, William J.; Verge, John P.; and Williamson, William R. N., to Lilly Industries Limited. Acylamino derivatives. 4,158,659, Cl. 260-307.00G.
Rotter, Christoph: *See*—
Mueller, Werner; Rotter, Christoph; and Welsch, Wolfgang, 4,158,485, Cl. 350-343.000.

Rousseau, Robert; and Manganaro, Charles A., to DCA-Diagnostic Corporation of America. Method of separating components in a biological fluid. 4,158,547, Cl. 23-230.600.

Rowatt, Robert J.: *See—*
Lynch, Thomas J.; and Rowatt, Robert J., 4,158,571, Cl. 106-271.000.

Rowcliffe, Arthur F.: *See—*
Bloom, Everett E.; Stiegler, James O.; Rowcliffe, Arthur F.; and Leitnaker, James M., 4,158,606, Cl. 176-87.000.

Rozenberg, Evgeny K.: *See—*
Volfkovich, Semen I.; Belov, Vladimir N.; Ershov, Vadim A.; Rozenberg, Evgeny K.; Shipov, Emmanuil I.; and Jumanova, Ljudmila V., 4,158,699, Cl. 422-189.000.

Rueggeberg, Werner: *See—*
Gard, George E.; Manning, Elvin K.; Rueggeberg, Werner; and Weinhold, Kerry L., 4,158,778, Cl. 250-461.00R.

Ruhrchemie Aktiengesellschaft: *See—*
Birnkraut, Hans-Walter; and Kluy, Werner, 4,158,588, Cl. 156-331.000.

Rupe, Chauncey O.: *See—*
Lam, Charles T. W.; and Rupe, Chauncey O., 4,158,546, Cl. 23-230.00B.

Rusche, Fredric. In situ pile forming method. 4,158,518, Cl. 405-240.000.

Rusco Industries, Inc.: *See—*
Riegelman, Harry M., 4,158,272, Cl. 49-431.000.

Russell, Edward J.: *See—*
Arends, Albert W.; Pickard, George L.; West, G. Allan; and Russell, Edward J., 4,158,539, Cl. 425-451.400.

Rybicki, Edward B.: *See—*
Dianetti, Joseph C.; and Rybicki, Edward B., 4,158,475, Cl. 350-50.000.

S & C Electric Company: *See—*
Biller, Bruce A.; and Scherer, Henry W., 4,158,830, Cl. 337-171.000.

S. C. Johnson & Son, Inc.: *See—*
Chapman, Francis E., 4,158,553, Cl. 51-304.000.

S.G.T.C. Societe Generale Internationale de Recherches Techniques et de Consulence S.a.: *See—*
Lavelli, Riccardo, 4,158,768, Cl. 250-202.000.

Saab-Scania Aktiebolag: *See—*
Sjodin, Bo, 4,158,766, Cl. 235-92.0DN.

Sadashige, Koichi: *See—*
Thomas, Robert G.; and Sadashige, Koichi, 4,158,855, Cl. 358-127.000.

Saenz, Hector. Removable mirrored wall covering. 4,158,274, Cl. 52-127.000.

Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
Gabano, Jean-Paul; and Broussely, Michel, 4,158,723, Cl. 429-197.000.

Sagara, Seiji: *See—*
Hattori, Hiroyuki; Ogawa, Hiroshi; Kishi, Hirotoshi; Umezawa, Kazumi; and Sagara, Seiji, 4,158,499, Cl. 355-8.000.

Saito, Takashi: *See—*
Akimoto, Seiichi; Watanabe, Mitsuhiro; Yoshida, Tomiharu; Sugaya, Zunichi; Saito, Takashi; and Ishii, Yoshimi, 4,158,600, Cl. 176-30.000.

Sakai, Yutaka: *See—*
Doi, Yoshikazu; and Sakai, Yutaka, 4,158,482, Cl. 350-214.000.

Sakoe, Hiroaki; and Chiba, Seibi, to Nippon Electric Co., Ltd. Speech recognition system with delayed output. 4,158,750, Cl. 179-1.0SD.

Sandler, Louis M., to P. R. Mallory & Co. Inc. Drive means and method for vacuum fluorescent display systems. 4,158,794, Cl. 315-169.100.

Sandoz, Inc.: *See—*
Nadelson, Jeffrey, 4,158,735, Cl. 546-116.000.

Sandvik Aktiebolag: *See—*
Wirfelt, Sven A. O., 4,158,522, Cl. 408-1.0BD.

Sangamo Weston, Inc.: *See—*
Tucker, Billy J., 4,158,856, Cl. 358-133.000.

Sansbury, Jerry F., to Sonoco Products Company. Composite container construction. 4,158,425, Cl. 220-461.000.

Sansui Electric Co., Ltd.: *See—*
Tarumi, Kenkichi; and Kanamori, Junichi, 4,158,795, Cl. 318-138.000.

Saracsan, Jeffrey W.: *See—*
Pearson, Charles J.; and Saracsan, Jeffrey W., 4,158,378, Cl. 152-353.00R.

Sarkes Tarzian, Inc.: *See—*
Valdettaro, Alarico A., 4,158,826, Cl. 334-88.000.

Sasaki, Kantaro; Kobayashi, Sumio; Sugitani, Yasuo; and Ishimura, Susumu, to Sumitomo Metal Industries Limited. Continuously casting machine. 4,158,380, Cl. 164-147.000.

Sato, Masaaki, to Olympus Optical Company Ltd. Automatic switching device for cassette tape recorder. 4,158,865, Cl. 360-73.000.

Saunders, Richard J., to Coherent, Inc. Apparatus and method for cutting and heat sealing woven thermoplastic material. 4,158,762, Cl. 219-121.00L.

Sawayama, Shigeru: *See—*
Kamada, Osamu; Watanabe, Kenzoh; and Sawayama, Shigeru, 4,158,726, Cl. 526-200.000.

Sawyer, Harold T., to Beehler, Vernon D., a part interest. Dynamic self-cleaning filter for liquids. 4,158,629, Cl. 210-137.000.

Schaar, Charles H., to Colgate-Palmolive Company. Diaper with extensible fastener. 4,158,363, Cl. 128-287.000.

Scharf, Friedrich: *See—*
Kehl, Albin; and Scharf, Friedrich, 4,158,718, Cl. 428-461.000.

Scheinpflug, Hans: *See—*
Dahn, Ursula; Hagenmaier, Hanspaul; Hohne, Helmut; Konig, Wilfried; Scheinpflug, Hans; and Zahner, Hans, 4,158,608, Cl. 195-80.00R.

Schellberg, John D.: *See—*
Gavin, David F.; Ardis, Alan E.; Katz, Lawrence E.; and Schellberg, John D., 4,158,660, Cl. 260-308.00B.

Scherer, Henry W.: *See—*
Biller, Bruce A.; and Scherer, Henry W., 4,158,830, Cl. 337-171.000.

Schmauch, Hugo: *See—*
Weber, Heinrich; Dungs, Horst; Urbye, Klaus; Beckmann, Franz; Schmauch, Hugo; and Flasche, Karl H., 4,158,550, Cl. 44-13.000.

Schmidt, Dieter: *See—*
Steffen, Hans; and Schmidt, Dieter, 4,158,707, Cl. 424-244.000.

Schmoock, Roy: *See—*
Shauger, Herbert; and Schmoock, Roy, 4,158,765, Cl. 235-92.0NT.

Schneider, Louis; and Graham, David E., to GAF Corporation. Broad spectrum herbicidal diacylimide compositions. 4,158,560, Cl. 71-118.000.

Scholtis, Walter: *See—*
Ehedy, Gustav; Kemter, Heinz; Ponitz, Wilfried; Ehrlich, Engelbert; Politze, Walter; Scholtis, Walter; and Wunsch, Wolfgang, 4,158,292, Cl. 66-190.000.

Scholz, John A.; and Gardner, Phillip J., to GTE Sylvania Incorporated. Metal halide arc discharge lamp. 4,158,789, Cl. 313-218.000.

Scholz, John A.: *See—*
Morris, James C.; Newell, P. Bruce; and Scholz, John A., 4,158,878, Cl. 362-3.000.

Schotzko, Jerry J. Miter box and frame doweling drill jig apparatus. 4,158,523, Cl. 408-115.00R.

Schriever, Theodore W.: *See—*
Brescia, Anthony J.; Fecca, Edward G.; Wenczl, Stephen; and Schriever, Theodore W., 4,158,336, Cl. 108-111.000.

Schroeder, Charles R.: *See—*
Hall, Douglas C.; and Schroeder, Charles R., 4,158,411, Cl. 206-531.000.

Schroeder, Kenneth W.; Isaacson, Bruce G.; and Lorenzi, Donald E., to Magnaflux Corporation. Demagnetizing methods and apparatus. 4,158,873, Cl. 361-149.000.

Schubart, Rolf E. R., to Dorst-Keramikaschinen-Bau Otto Dorst U. Dipl.-Ing. Walter Schlegel. Method for pressing articles such as plates from pulverulent porcelain composition. 4,158,691, Cl. 264-314.000.

Schubert, Karl-Friedrich: *See—*
Hanselmann, Dieter; Prohaska, Hans; and Schubert, Karl-Friedrich, 4,158,247, Cl. 15-250.300.

Schulz, Johann G. D.; and Onopchenko, Anatoli, to Gulf Research & Development Company. Process for converting cyclopentane to glutaric acid. 4,158,739, Cl. 562-543.000.

Schumann, Paul A., Jr.: *See—*
Mathisen, Einar S.; Schumann, Paul A., Jr.; and Tong, Alvin H., 4,158,505, Cl. 356-308.000.

Schuster, Eberhard; and Kersting, Arno, to Kraftwerk Union Aktiengesellschaft. Method for separating gaseous mixtures of matter. 4,158,614, Cl. 204-157.10R.

Schutte, Richard W.: *See—*
Becker, Henry E.; McConnell, Albert L.; and Schutte, Richard W., 4,158,594, Cl. 162-112.000.

Schwab, Carl E., to General Signal Corporation. 3-D Radar comprising 2-D radar with height finding attachment. 4,158,840, Cl. 343-6.00R.

Schwager, Frederic A., to Mattel, Inc. Governor rotor assembly. 4,158,307, Cl. 73-535.000.

Schwaiger, Max: *See—*
Rieder, Heinz; and Schwaiger, Max, 4,158,509, Cl. 356-395.000.

Schwartz, Albert B.: *See—*
Smith, Fritz A.; Breckenridge, Lloyd L.; and Schwartz, Albert B., 4,158,676, Cl. 585-481.000.

Schwarzenbek, Eugene F., to Cogas Development Company. Treatment of hydrocarbons by hydrogenation and fines removal. 4,158,622, Cl. 208-177.000.

SCM Corporation: *See—*
Hasman, John M., 4,158,665, Cl. 260-409.000.
Hasman, John M., 4,158,666, Cl. 260-409.000.

Scott, Allan W.: *See—*
Lien, Erling L.; and Scott, Allan W., 4,158,791, Cl. 315-3.500.

Scott, Leon S.; and Sommers, Roy W., to Du Pont de Nemours, E. I., and Company. Process for the production of fiber-grade terephthalic acid. 4,158,738, Cl. 562-416.000.

Scott Paper Company: *See—*
Becker, Henry E.; McConnell, Albert L.; and Schutte, Richard W., 4,158,594, Cl. 162-112.000.

Scruggs, Jack E. Scoring device. 4,158,342, Cl. 116-225.000.

Seaman, Jeffrey R.: *See—*
Fisher, Robert J.; and Seaman, Jeffrey R., 4,158,483, Cl. 350-289.000.

Seelenbinder, Terry G.; Hudson, Walter A.; and Oddo, Eugene P., to AM International, Inc. Developer apparatus for diazotype copy materials. 4,158,495, Cl. 354-318.000.

Sefko, John: *See—*
Pavlik, Norman M.; and Sefko, John, 4,158,561, Cl. 75-0.5BA.

Seiden, Lewis J.; and Magnano, Joseph P., to T-Bar, Incorporated. Patch module. 4,158,472, Cl. 339-19.000.

Selwitz, Charles M.; and Thayer, Helen I., to Gulf Research & Development Company. Process for improving color of certain alkenyl succinic anhydrides. 4,158,664, Cl. 260-346.740.

Senturia, Stephen D., to Massschusetts Institute of Technology. Gapped gate charge-flow transistor with a thin film sensor having two modes of conduction within the gapped gate used to sense a property of the ambient environment. 4,158,807, Cl. 324-71.0SN.
SER Co.: *See*—
Newbegin, Everett H., 4,158,445, Cl. 242-39.000.
Serafin, Joseph W. Mobile chair lift. 4,158,524, Cl. 414-678.000.
Shadle, Glenn E.: *See*—
Bauer, Edmund G.; and Shadle, Glenn E., 4,158,610, Cl. 201-1.000.
Shannon, Alan J.: *See*—
van Bavel, Michael G.; and Shannon, Alan J., 4,158,431, Cl. 235-304.100.
Shapiro, Gerald N.; Goldstone, Bertram J.; Simone, Joseph D.; and Spignese, Edward E., to Raytheon Company. Fast Fourier Transform processor using serial processing and decoder arithmetic and control section. 4,158,888, Cl. 364-726.000.
Sharp Kabushiki Kaisha: *See*—
Nishiyama, Mitsuru, 4,158,484, Cl. 350-338.000.
Sharp, Russell G.: *See*—
Reed, Charles C.; Cooley, Denton A.; and Sharp, Russell G., 4,158,693, Cl. 422-46.000.
Sharpe, Donald E.; and Van Valkenburg, Howard E., to Automation Industries, Inc. Time-variable bandwidth ultrasonic testing apparatus. 4,158,308, Cl. 73-609.000.
Shauger, Herbert; and Schmoock, Roy, to Fischer & Porter Co. Totalizer for two-wire transmitter. 4,158,765, Cl. 235-92.0NT.
Shearer, Jack F., to Akzona Incorporated. Convertible cylindrical electrical connector. 4,158,473, Cl. 339-31.00R.
Shikama, Masaharu: *See*—
Kimura, Harutaka; Nozawa, Seiichi; Mukai, Seiichi; and Shikama, Masaharu, 4,158,729, Cl. 528-238.000.
Shimada, Toshihiko: *See*—
Yonezaki, Jimpachi; Takahashi, Yoshihiro; Shimada, Toshihiko; and Okuyama, Katsuo, 4,158,754, Cl. 179-98.000.
Shinko Electric Co., Ltd.: *See*—
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,158,435, Cl. 235-463.000.
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,158,834, Cl. 340-146.3MA.
Shipley, William W., to Caterpillar Tractor Co. Method for dynamically timing an apparatus. 4,158,305, Cl. 73-119.00A.
Shipov, Emmanuil I.: *See*—
Volfkovich, Semen I.; Belov, Vladimir N.; Ershov, Vadim A.; Rozenberg, Evgeny K.; Shipov, Emmanuil I.; and Jumanova, Ljudmila V., 4,158,699, Cl. 422-189.000.
Shofu Dental Manufacturing Co., Ltd.: *See*—
Miyai, Kozo; Suzuki, Narishige; Kawakami, Takaya; and Kuze, Ikuo, 4,158,641, Cl. 252-301.40F.
Short, Edward H., III: *See*—
Witten, John E.; Wood, Loren E.; and Short, Edward H., III, 4,158,422, Cl. 220-89.00A.
Short, Hoyt E., to Tuftco Corporation. Narrow gauge cut pile looper apparatus. 4,158,339, Cl. 112-79.00R.
Sibley, Howard W., to Carrier Corporation. Spray generators for absorption refrigeration systems. 4,158,295, Cl. 62-476.000.
Siemens Aktiengesellschaft: *See*—
Geckeler, Siegfried, 4,158,479, Cl. 350-96.310.
Heinzl, Joachim; and Kattner, Erich, 4,158,847, Cl. 346-140.00R.
Kuny, Wilhelm; and Langecker, Karl, 4,158,823, Cl. 333-151.000.
Lehmann, Erhard; Martin, Heinz; and Voss, Peter, 4,158,850, Cl. 357-38.000.
Mueller, Werner; Rotter, Christoph; and Welsch, Wolfgang, 4,158,485, Cl. 350-343.000.
Signode Corporation: *See*—
Gould, Russell J., 4,158,711, Cl. 428-57.000.
Silverblatt, Bernard L.: *See*—
Cooper, Frank W., Jr.; Silverblatt, Bernard L.; Knight, Charles B.; and Berringer, Robert T., 4,158,605, Cl. 176-61.000.
Simmons, David H.; and Panelo, Alfredo A., to Litton Systems, Inc. DC to DC converter. 4,158,881, Cl. 363-25.000.
Simone, Joseph D.: *See*—
Shapiro, Gerald N.; Goldstone, Bertram J.; Simone, Joseph D.; and Spignese, Edward E., 4,158,888, Cl. 364-726.000.
Singer Company, The: *See*—
Edwards, William J., 4,158,340, Cl. 112-231.000.
Smith, Michael R.; Congleton, David B.; and Diamond, Arthur S., 4,158,715, Cl. 428-412.000.
Sinha, Rabindra K., to Calgon Corporation. Catalytic carbon for oxidation of carbon monoxide in the presence of sulfur dioxide. 4,158,643, Cl. 252-447.000.
Sjodin, Bo, to Saab-Scania Aktiebolag. Inspection of elongated workpieces such as random length boards. 4,158,766, Cl. 235-92.0DN.
SKF Compagnie d'Applications Mecaniques: *See*—
Guerton, Jean-Pierre; Waleckx, Jean; and Monville, Jean-Michel, 4,158,282, Cl. 57-58.720.
SKF Kugellagerfabriken GmbH: *See*—
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,158,394, Cl. 175-228.000.
Skinner, Dale D.; and Thompson, John H., to United States of America, Navy. Transmit receive solid state switch for electroacoustic transducers. 4,158,781, Cl. 307-99.000.
Smead, Robert G.: *See*—
Bagby, Thomas L.; Demeny, Gary L.; and Smead, Robert G., 4,158,344, Cl. 118-630.000.
Smith, Arthur W. Electric hand tool. 4,158,313, Cl. 74-22.00A.
Smith, Edgar C.; and Campbell, James B., to Three Dimensional Photography Corporation, The. Projection printing method and apparatus. 4,158,501, Cl. 355-77.000.
Smith, Fritz A.; Breckenridge, Lloyd L.; and Schwartz, Albert B., to Mobil Oil Corporation. Isomerization process. 4,158,676, Cl. 585-481.000.
Smith, Jack C. Method and apparatus for decoiling sheet material. 4,158,301, Cl. 72-183.000.
Smith, Lance G.; and Knoll, Jerry N., to Halliburton Company. Cementing skid with recirculating mixer. 4,158,510, Cl. 366-16.000.
Smith, Michael R.; Congleton, David B.; and Diamond, Arthur S., to Singer Company, The. Laser recording film with opaque coating. 4,158,715, Cl. 428-412.000.
Smith, Oliver W.: *See*—
Koleske, Joseph V.; Knopf, Robert J.; and Smith, Oliver W., 4,158,652, Cl. 260-29.4UA.
Smith, Oscar C.: *See*—
Mason, Lloyd R.; and Smith, Oscar C., 4,158,348, Cl. 123-97.00B.
Smith, Richard C., to Westinghouse Electric Corp. Determination of uranium content in material. 4,158,769, Cl. 250-255.000.
Smither, Miles A., to Geosource Inc. Instantaneous floating point amplifier. 4,158,819, Cl. 330-9.000.
SmithKline Corporation: *See*—
Gleason, John G., 4,158,733, Cl. 544-29.000.
S.A. des Anciens Etablissements Paul Wurth: *See*—
Mailliet, Pierre H., 4,158,367, Cl. 137-340.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Chiovini, Jacky; Marion, Jean-Paul; and Adamer, Siegfried, 4,158,708, Cl. 426-650.000.
Societe de Fabrication d'Instruments de Mesure (S.F.I.M.): *See*—
de Ponteves, Dominique; Naussac, Francois J.; and Dujols, Andre, 4,158,504, Cl. 356-247.000.
Sogo, Marilyn R., to Burroughs Corporation. Method of forming a metal interconnect structure for integrated circuits. 4,158,613, Cl. 204-15.000.
Somers, Thomas N.: *See*—
Thompson, William H.; Worthington, Ralph E.; and Somers, Thomas N., 4,158,558, Cl. 71-34.000.
Sommers, Roy W.: *See*—
Scott, Leon S.; and Sommers, Roy W., 4,158,738, Cl. 562-416.000.
Sonoco Products Company: *See*—
Sansbury, Jerry F., 4,158,425, Cl. 220-461.000.
Sony Corporation: *See*—
Nishimura, Makoto; Naito, Keiichi; Fujiwara, Yoshio; and Kobayashi, Naotake, 4,158,725, Cl. 526-52.100.
Suzuki, Yutaka, 4,158,450, Cl. 248-1.000.
South, Aubrey, Jr.: *See*—
Moczygemba, George A.; and South, Aubrey, Jr., 4,158,654, Cl. 260-40.00R.
Sparks, Bryan D.: *See*—
Meadus, Frederick W.; Puddington, Ira E.; and Sparks, Bryan D., 4,158,648, Cl. 260-15.000.
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Hogan, William F., 4,158,777, Cl. 250-445.00R.
Sperry Rand Corporation: *See*—
Campbell, Willis R.; and Freimuth, John H., 4,158,331, Cl. 100-5.000.
Risser, Roger L.; Kelsey, Arthur L.; and Stiefvater, Thomas L., 4,158,469, Cl. 406-89.000.
Spignese, Edward E.: *See*—
Shapiro, Gerald N.; Goldstone, Bertram J.; Simone, Joseph D.; and Spignese, Edward E., 4,158,888, Cl. 364-726.000.
Spitzer, Hermann J. Solar energy collectors. 4,158,355, Cl. 126-271.000.
Splittstoesser, Clair D.: *See*—
Thomas, George A.; and Splittstoesser, Clair D., 4,158,280, Cl. 56-202.000.
Sprecher & Schuh AG: *See*—
Stephanides, Viktor, 4,158,872, Cl. 361-128.000.
Stahl, Josiah W., Jr.: *See*—
Gaghan, Stephen B.; and Stahl, Josiah W., Jr., 4,158,253, Cl. 28-289.000.
Stan, William. Automatic irrigation system for control valve assembly. 4,158,441, Cl. 239-68.000.
Standard Havens, Inc.: *See*—
Bundy, Richard P.; Zumsteg, D. Bruce; and Rheinfrank, Lamson, Jr., 4,158,554, Cl. 55-379.000.
Standard Oil Company, The: *See*—
Klechka, Ernest W.; and Hemsath, James R., 4,158,541, Cl. 432-116.000.
Standard Oil Company (Indiana): *See*—
Lee, Richard J., 4,158,677, Cl. 585-456.000.
Standard T Chemical Company, Inc.: *See*—
Brower, Loyd R., Jr.; Madsen, Leonard P.; and Zutaut, Chesley L., 4,158,619, Cl. 204-181.00R.
Stanley, Gerald R., to Crown International, Inc. Low level preamplifier circuit. 4,158,820, Cl. 330-149.000.
Stanulonis, John J.: *See*—
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., 4,158,621, Cl. 208-114.000.
Stark, Karl-Heinz: *See*—
Fenner, Hans; Auwarter, Wilhelm; and Stark, Karl-Heinz, 4,158,465, Cl. 296-193.000.
Starp, Franz: *See*—
Rommel, Werner; and Starp, Franz, 4,158,779, Cl. 250-515.000.
Starr, Anthony J., to Container Corporation of America. Sealable closure fastener. 4,158,423, Cl. 220-320.000.

Stearns, Stanley D. Chromatographic multi-sample valving apparatus. 4,158,630, Cl. 210-198.00C.
Stefan, Gunter, to Timerax Holdings Ltd. Pool liner retainer. 4,158,244, Cl. 4-172.210.
Stefanski, Lech: *See—*
Jasniewicz, Zbigniew; Knyszewski, Jan; Osrodek, Tadeusz; Kielczynski, Zdzislaw; and Stefanski, Lech, 4,158,249, Cl. 17-73.000.
Steffen, Hans; and Schmidt, Dieter, to Hoffmann-La Roche Inc. Parenteral preparations. 4,158,707, Cl. 424-244.000.
Steiner, Edward L.: *See—*
Gray, Gerald A., Jr.; and Steiner, Edward L., 4,158,886, Cl. 364-518.000.
Stephanides, Viktor, to Sprecher & Schuh AG. Surge diverter. 4,158,872, Cl. 361-128.000.
Stephens, Thomas C.: *See—*
Clemens, John E.; Stephens, Thomas C.; Dilz, Albert E.; and Hewlett, James A., 4,158,842, Cl. 343-7.0PF.
Stephenson, Alvis D., Jr.: *See—*
Li, Hsiao-Yuan; Naden, Rex A.; Stephenson, Alvis D., Jr.; and Lee, Gene D., 4,158,811, Cl. 324-210.000.
Stewart, James A., to GTE Automatic Electric Laboratories Incorporated. Carrier subscriber telephone station terminal loop current booster. 4,158,752, Cl. 179-2.50R.
Stiefvater, Thomas L.: *See—*
Risser, Roger L.; Kelsey, Arthur L.; and Stiefvater, Thomas L., 4,158,469, Cl. 406-89.000.
Stiegler, James O.: *See—*
Bloom, Everett E.; Stiegler, James O.; Rowcliffe, Arthur F.; and Leitnaker, James M., 4,158,606, Cl. 176-87.000.
Stillhard, Bruno; and Naf, Hans, to Gebruder Buhler AG. Process and apparatus for manufacturing molded parts from granulated plastic materials. 4,158,540, Cl. 425-550.000.
Stirrat, William M.; and Brandt, Donald H., to United States of America, Army. Training flare dispensing system. 4,158,323, Cl. 89-1.50R.
Stokes, Arthur J. Radiation detector with improved performance characteristics. 4,158,774, Cl. 250-374.000.
Stoneman, Harold R. Multiple passage roof flashing assembly. 4,158,276, Cl. 52-219.000.
Storzinger, Thomas; Langer, Erich; and Pick, Peter, to Knorr-Bremse GmbH. Hold-back valve for single release air brakes. 4,158,369, Cl. 137-599.200.
Strametz, William A. Cam removing tool. 4,158,318, Cl. 81-3.00R.
Strong, Grant H. Chain-drive transmission. 4,158,316, Cl. 74-217.00S.
Stubenrauch, Gerd; Hamprecht, Gerhard; Wuerzer, Bruno; and Retzlaff, Guenter, to BASF Aktiengesellschaft. Substituted 2,1,3-benzothiadiazine compounds. 4,158,559, Cl. 71-91.000.
Sudo, Tomoshige: *See—*
Kunioka, Kazuo; Noguchi, Takao; and Sudo, Tomoshige, 4,158,758, Cl. 219-10.430.
Sugano, Yoshiaki: *See—*
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Sugaya, Zunichi: *See—*
Akimoto, Seiichi; Watanabe, Mitsuhiro; Yoshida, Tomiharu; Sugaya, Zunichi; Saito, Takashi; and Ishii, Yoshimi, 4,158,600, Cl. 176-30.000.
Sugitani, Yasuo: *See—*
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Sullivan, John V., to Commonwealth Scientific and Industrial Research Organization. High intensity atomic spectral lamp with interchangeable cathode. 4,158,790, Cl. 313-231.600.
Sullivan, Paul F.; Moore, Randall W.; Hottel, Hoyt C., Jr.; Pelletier, Raymond G.; Gobush, William; and Lynch, Francis deS., to Acushnet Company. Monitoring system for measuring kinematic data of golf balls. 4,158,853, Cl. 358-93.000.
Sullivan, William E.; and Meetze, Murray O., Jr., to Ridson Manufacturing Company, The. Device for releasing a volatile substance in a controlled manner. 4,158,440, Cl. 239-1.000.
Sumitomo Electric Industries, Ltd.: *See—*
Akai, Shin-ichi; Nishida, Yasuhiro; and Fujita, Keiichiro, 4,158,851, Cl. 357-63.000.
Sumitomo Metal Industries Limited: *See—*
Sasaki, Kantaro; Kobayashi, Sumio; Sugitani, Yasuo; and Ishimura, Susumu, 4,158,380, Cl. 164-147.000.
Sun, Cedric; and Roach, Charles J., to Pall Corporation. Inlet air cleaner assembly for turbine engines. 4,158,449, Cl. 244-136.000.
Sunds Aktiebolag: *See—*
Pettersson, Bengt E., 4,158,597, Cl. 162-238.000.
SunTerra Corporation: *See—*
Jones, John W., 4,158,291, Cl. 60-641.000.
Sutcliffe, Michael: *See—*
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Miyai, Kozo; Suzuki, Narishige; Kawakami, Takaya; and Kuze, Ikuo, 4,158,641, Cl. 252-301.40F.
Suzuki, Seiji; Nishiyama, Yoshihisa; and Kitagawa, Tohru, to Tokyo Electric Co., Ltd. Electronic weight measuring device. 4,158,396, Cl. 177-210.00R.
Suzuki, Shigeru; and Tani, Tatsuo, to Ricoh Co., Ltd. Copying apparatus. 4,158,497, Cl. 355-8.000.
Suzuki, Yutaka, to Sony Corporation. Mounting of parts on a chassis or base plate. 4,158,450, Cl. 248-1.000.
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., to Gulf Research & Development Company. Process for increasing gasoline yield and quality during catalytic cracking of high metals content charge stocks using an alumina-aluminum phosphate-silica-zeolite catalyst. 4,158,621, Cl. 208-114.000.
Swiss Aluminium Ltd.: *See—*
Dantzig, Jonathan A.; and Tyler, Derek E., 4,158,632, Cl. 210-510.000.
Switacz-Tomaszewska, Jadwiga: *See—*
Kalinowski, Leonard; Frackiewicz, Elzbieta; Janiszewska, Leonarda; Pawlik, Anna; Kikolska, Danuta; Pisarek, Jerzy; Szadkowska, Maria; and Switacz-Tomaszewska, Jadwiga, 4,158,607, Cl. 195-62.000.
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T-Bar, Incorporated: *See—*
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Tagaya, Ryosaku: *See—*
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Tajima, Tsuneaki; and Matsuo, Yohichi, to Nippon Electric Co., Ltd. Air cooling equipment for electronic systems. 4,158,875, Cl. 361-384.000.
Takahashi, Kotei: *See—*
Yamashita, Sinobu; and Takahashi, Kotei, 4,158,404, Cl. 192-3.580.
Takahashi, Toshio; and Tagaya, Ryosaku, to Eisai Co., Ltd. Method and apparatus for detecting and screening foreign matters. 4,158,625, Cl. 209-524.000.
Takahashi, Yoshihiro: *See—*
Yonezaki, Jimpachi; Takahashi, Yoshihiro; Shimada, Toshihiko; and Okuyama, Katsuo, 4,158,754, Cl. 179-98.000.
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Talley Industries of Arizona, Inc.: *See—*
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Tamai, Mitsuru: *See—*
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Tamasovics, John F.: *See—*
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Ellis, Robert W.; and Manaton, Charles D., 4,158,813, Cl. 325-102.000.
Tanaka, Eiji: *See—*
Kuroi, Hisashi; Hatada, Masamichi; Morita, Kumio; and Tanaka, Eiji, 4,158,792, Cl. 315-86.000.
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Tappe, Horst: *See—*
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Tarumi, Kenkichi; and Kanamori, Junichi, to Sansui Electric Co., Ltd. Brushless DC motors. 4,158,795, Cl. 318-138.000.
Tatemoto, Masayoshi; and Nakagawa, Tsuneo, to Daikin Kogyo Co., Ltd. Segmented polymers containing fluorine and iodine and their production. 4,158,678, Cl. 260-884.000.
Taylor, David W.; and Waucheul, Jean P., to Northern Telecom Limited. Cable with color coding identification of groups. 4,158,746, Cl. 174-112.000.
Teccor Electronics, Inc.: *See—*
Mason, William B., 4,158,759, Cl. 219-10.55B.
Teich, Wesley W.: *See—*
Bowen, Robert F.; Freedman, George; Teich, Wesley W.; Martel, Thomas J.; and Eves, E. Eugene, II, 4,158,760, Cl. 219-10.55E.
Telautograph Corporation: *See—*
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Teldix GmbH: *See—*
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Telefonaktiebolaget L M Ericsson: *See—*
Peterson, Sven T., 4,158,877, Cl. 361-412.000.
Telex Computer Products, Inc.: *See—*
Ysbrand, Floyd R.; and Crafts, Robert L., 4,158,870, Cl. 360-128.000.
Tetra Pak Developpement SA: *See—*
Nilsson, Ingvar E., 4,158,692, Cl. 264-320.000.
Tettamanzi, Natale: *See—*
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Texaco Inc.: *See—*
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Texas Instruments Incorporated: *See—*
Li, Hsiao-Yuan; Naden, Rex A.; Stephenson, Alvis D., Jr.; and Lee, Gene D., 4,158,811, Cl. 324-210.000.
Reinberg, Alan R., 4,158,286, Cl. 58-23.00C.
van Bavel, Michael G.; and Shannon, Alan J., 4,158,431, Cl. 235-304.100.
van Bavel, Michael G., 4,158,432, Cl. 235-304.100.
Texas Medical Products, Inc.: *See—*
Reed, Charles C.; Cooley, Denton A.; and Sharp, Russell G., 4,158,693, Cl. 422-46.000.
Textron Inc.: *See—*
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Thayer, Helen I.: *See—*
Selwitz, Charles M.; and Thayer, Helen I., 4,158,664, Cl. 260-346.740.
Thiessen, Fred L. Package for candy canes. 4,158,408, Cl. 206-443.000.
Thomas & Betts Corporation: *See—*
O'Loughlin, Francis A., 4,158,302, Cl. 72-409.000.
Thomas, George A.; and Splittstoesser, Clair D., to AMF Incorporated. Rotary lawn mower. 4,158,280, Cl. 56-202.000.
Thomas, Robert G.; and Sadashige, Koichi, to RCA Corporation. Dropout compensator with proportional duration dropout detector. 4,158,855, Cl. 358-127.000.
Thomason, Harry E.; and Thomason, Harry J. L. Heat and cold storage apparatus. 4,158,358, Cl. 126-400.000.
Thomason, Harry J. L.: *See—*
Thomason, Harry E.; and Thomason, Harry J. L., 4,158,358, Cl. 126-400.000.
Thompson, John H.: *See—*
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Thompson, Neil E. S.: *See—*
Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,158,734, Cl. 546-251.000.
Thompson, William H.; Worthington, Ralph E.; and Somers, Thomas N., to Pennzoil Company. Potassium polyphosphate fertilizers. 4,158,558, Cl. 71-34.000.
Thomson-CSF: *See—*
D'Auria, Luigi; Ostrowsky, Daniel; and Jacques, Andre, 4,158,478, Cl. 350-96.230.
Deman, Pierre; and Potage, Jean, 4,158,749, Cl. 179-1.0SC.
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Thorwirth, Gunter: *See—*
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Three Dimensional Photography Corporation, The: *See—*
Smith, Edgar C.; and Campbell, James B., 4,158,501, Cl. 355-77.000.
TI Fords Limited: *See—*
Ford, Geoffrey E.; Pantelides, Antis; and Willsmer, Trevor R., 4,158,624, Cl. 209-523.000.
Tidemalm, Gustav H.; and Vidinghoff, Bjorn E., to AB Bofors. Hydraulic cylinder assembly for positioning an artillery barrel. 4,158,324, Cl. 89-41.00H.
Timerax Holdings Ltd.: *See—*
Stefan, Gunter, 4,158,244, Cl. 4-172.210.
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Tokyo Shibaura Electric Co., Ltd.: *See—*
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Tomaja, David L., to Phillips Petroleum Company. Uranium oxide production. 4,158,616, Cl. 204-157.10R.
Tong, Alvin H.: *See—*
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Toppan Printing Co., Ltd.: *See—*
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Tops, Adrianus C.; and Iemenschot, Johannes A., to U.S. Philips Corporation. Video discplayer. 4,158,867, Cl. 360-99.000.
Towmotor Corporation: *See—*
Darnell, William E., 4,158,353, Cl. 123-119.00B.
Townsend, Robert L., to Purex Corporation. Cleaning and disinfecting hard surfaces. 4,158,575, Cl. 134-6.000.
Toyo Seikan Kaisha, Ltd.: *See—*
Inoue, Yoshito, 4,158,417, Cl. 414-412.000.
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Ando, Masahisa; Kato, Keigo; Yamazaki, Masami; and Kuroiwa, Yosio, 4,158,351, Cl. 123-119.00A.
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Transac — Compagnie pour le Developpement des Transactions Automatiques: *See—*
Michaud, Andre; and Eymard, Pierre, 4,158,862, Cl. 360-56.000.
Trendel, Dennis J.: *See—*
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Trestin, Alessandro, to Fer Fabbrica Europea Riscaldamento S.p.A. Boiler for liquid and/or gaseous fuels. 4,158,345, Cl. 122-214.000.
TRW Inc.: *See—*
Herbenar, Edward J., 4,158,511, Cl. 403-113.000.
Tsai, Shirley C., to Gulf Research & Development Company. Recovery of oil from oil shale. 4,158,638, Cl. 208-11.0LE.
Tsaknis, Peter J.; and Lux, Virginia J., to United States of America, Army. Method for collecting histologic material. 4,158,709, Cl. 427-2.000.
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Tucker, Billy J., to Sangamo Weston, Inc. Apparatus and method for generating digital words representative of video information. 4,158,856, Cl. 358-133.000.
Tufteo Corporation: *See—*
Short, Hoyt E., 4,158,339, Cl. 112-79.00R.
Tyler, Derek E.: *See—*
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Uba, Toshio: *See—*
Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, 4,158,300, Cl. 72-148.000.
Uda, Masayuki, to Hoshidenki-Seizo Kabushiki Kaisha. Method of making a spark gap device for a cathode ray tube socket. 4,158,254, Cl. 29-25.180.
Umetsu, Hiroshi: *See—*
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Union Carbide Corporation: *See—*
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United Cabinet Corporation, The: *See—*
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United States of America
Army: *See—*
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Barnes, Roswell P., Jr.; and Fellows, Glenn E., 4,158,832, Cl. 340-38.00S.
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Stirrat, William M.; and Brandt, Donald H., 4,158,323, Cl. 89-1.50R.
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Energy: *See—*
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Bloom, Everett E.; Stiegler, James O.; Rowcliffe, Arthur F.; and Leitnaker, James M., 4,158,606, Cl. 176-87.000.
Kaun, Thomas D., 4,158,720, Cl. 428-567.000.
Reedy, Gerald T., 4,158,772, Cl. 250-338.000.
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Anderson, Floyd A. High performance ammonium nitrate propellant. 4,158,583, Cl. 149-19.400.
Chutjian, Ara; and Ajello, Joseph M. High resolution threshold photoelectron spectroscopy by electron attachment. 4,158,775, Cl. 250-423.00P.
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Aldrich, Billy R.; and Whitt, William D., 4,158,742, Cl. 13-20.000.
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Hardesty, Thomas K. C., 4,158,322, Cl. 89-1.00B.
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Klawitter, Jerome J.; and Bhatti, Nazir A., 4,158,684, Cl. 264-43.000.
McKechnie, John C., 4,158,258, Cl. 33-174.00P.
Osburn, Michael R., 4,158,334, Cl. 102-16.000.
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U.S. Philips Corporation: *See—*
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United Technologies Corporation: *See—*
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University of Southern California: *See—*
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Upjohn Company, The: *See—*
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Upton, Charles J.: *See—*
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Urbye, Klaus: *See—*
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Noblanc, Alain G. N.; and Valenchon, Claude P., 4,158,516, Cl. 405-196.000.

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Massa, Richard L.; Murray, Robert C.; and Cook, Kenneth J., 4,158,808, Cl. 324-74.000.

van Bavel, Michael G.; and Shannon, Alan J., to Texas Instruments Incorporated. Self-test feature for appliances or electronic systems operated by microprocessor. 4,158,431, Cl. 235-304.100.

van Bavel, Michael G., to Texas Instruments Incorporated. Control of self-test feature for appliances or electronic equipment operated by microprocessor. 4,158,432, Cl. 235-304.100.

Vandenhoeck, Jean-Paul. Energy recovery and storage system. 4,158,385, Cl. 165-39.000.

Vanderheyden, Eric E. E., to AMP Incorporated. Variable timing circuit for card readers and the like. 4,158,436, Cl. 235-466.000.

Van Dijck, Frans S., to N.V. Weefautomaten Picanol. Process and device for watching the weft on weaving looms. 4,158,372, Cl. 139-370.100.

Van Haasteren, Adrian J., Jr.: *See—*
Demick, Eugene; and Van Haasteren, Adrian J., Jr., 4,158,491, Cl. 353-90.000.

Van Meter, Chester J. Sillcock with water relief system. 4,158,366, Cl. 137-312.000.

Van Valkenburg, Howard E.: *See—*
Sharpe, Donald E.; and Van Valkenburg, Howard E., 4,158,308, Cl. 73-609.000.

Varian Associates, Inc.: *See—*
Lien, Erling L.; and Scott, Allan W., 4,158,791, Cl. 315-3.500.
Nelson, Norvell J., 4,158,717, Cl. 428-446.000.

Varta Batterie Aktiengesellschaft: *See—*
Lauck, Helmut; and Kruger, Franz-Josef, 4,158,722, Cl. 429-194.000.

VEB Wirkmaschinenbau Karl-Marx-Stadt: *See—*
Ehedy, Gustav; Kemter, Heinz; Ponitz, Wilfried; Ehrlich, Engelbert; Politze, Walter; Scholtß, Walter; and Wunsch, Wolfgang, 4,158,292, Cl. 66-190.000.

Verge, John P.: *See—*
Ross, William J.; Verge, John P.; and Williamson, William R. N., 4,158,659, Cl. 260-307.00G.

Vice, Charles L. Sound reproducing system. 4,158,400, Cl. 181-152.000.

Victor Company of Japan, Ltd.: *See—*
Hiraguri, Seisuke, 4,158,857, Cl. 358-139.000.

Vidinghoff, Bjorn E.: *See—*
Tidemalm, Gustav H.; and Vidinghoff, Bjorn E., 4,158,324, Cl. 89-41.00H.

Vitous, Charles J., to Cory Food Services, Inc. Dual vented brewer. 4,158,330, Cl. 99-295.000.

Vitrofil S.p.A.: *See—*
Brichta, Corrado; Tettamanzi, Natale; and Rial, Elio, 4,158,714, Cl. 428-391.000.

Volfkovich, Semen I.; Belov, Vladimir N.; Ershov, Vadim A.; Rozenberg, Evgeny K.; Shipov, Emmanuil I.; and Jumanova, Ljudmila V. Installation for the production of yellow phosphorus. 4,158,699, Cl. 422-189.000.

von Strandtmann, Max: *See—*
Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, 4,158,663, Cl. 260-345.200.

von Tirpitz, Wolf: *See—*
Dippold, Johann; and von Tirpitz, Wolf, 4,158,338, Cl. 109-79.000.

Voss, Peter: *See—*
Lehmann, Erhard; Martin, Heinz; and Voss, Peter, 4,158,850, Cl. 357-38.000.

Wahl, Josef: *See—*
Moller, Heinz; and Wahl, Josef, 4,158,350, Cl. 123-117.00R.

Waleckx, Jean: *See—*
Guerton, Jean-Pierre; Waleckx, Jean; and Monville, Jean-Michel, 4,158,282, Cl. 57-58.720.

Walek, Walter J.: *See—*
Cuff, Frederick L.; and Walek, Walter J., 4,158,537, Cl. 425-260.000.

Walter, Lothar: *See—*
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,158,394, Cl. 175-228.000.

Wan, Jeffrey K. S., to Canadian Patents and Development Limited. Phosphorescence exhibiting materials for optically pumped lasers. 4,158,822, Cl. 331-94.50L.

Wang, Samuel S.; and Huliganga, Ernie F., to American Cyanamid Company. Process for froth flotation of phosphate ores. 4,158,623, Cl. 209-166.000.

Warner, Gustav: *See—*
Hentschel, Volkmar; and Warner, Gustav, 4,158,573, Cl. 127-19.000.

Warner-Lambert Company: *See—*
Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, 4,158,663, Cl. 260-345.200.

Wasielewski, Richard J.: *See—*
Cummisford, Robert G.; Wasielewski, Richard J.; and Krueger, Robert K., 4,158,574, Cl. 127-32.000.

Watanabe, Kei: *See—*
Matsumoto, Masayasu; Iida, Kazuyoshi; Kondo, Yoshikazu; Mizuno, Keiichiro; Nomoto, Sadao; Murayama, Noriaki; Watanabe, Kei; and Katayama, Tomonori, 4,158,401, Cl. 181-210.000.

Watanabe, Kenzoh: *See—*
Kamada, Osamu; Watanabe, Kenzoh; and Sawayama, Shigeru, 4,158,726, Cl. 526-200.000.

Watanabe, Masao: *See—*
Goto, Osamu; Watanabe, Masao; and Kadoshima, Yoshio, 4,158,349, Cl. 123-117.00A.

Watanabe, Mitsuhiro: *See—*
Akimoto, Seiichi; Watanabe, Mitsuhiro; Yoshida, Tomiharu; Sugaya, Zunichi; Saito, Takashi; and Ishii, Yoshimi, 4,158,600, Cl. 176-30.000.

Waterhouse, John S.: *See—*
Baumann, Niklaus; Zweifel, Hans; Baumann, Marcus; and Waterhouse, John S., 4,158,730, Cl. 528-273.000.
Baumann, Niklaus; Zweifel, Hans; Baumann, Marcus; and Waterhouse, John S., 4,158,731, Cl. 528-322.000.

Watts, Grady. Tank cleaning apparatus. 4,158,365, Cl. 134-113.000.

Waucheul, Jean P.: *See—*
Taylor, David W.; and Waucheul, Jean P., 4,158,746, Cl. 174-112.000.

Weatherford/DMC, Inc.: *See—*
Chammas, Edmond D.; and Lewis, Edwin C., II, 4,158,389, Cl. 166-297.000.

Weber, Heinrich; Dungs, Horst; Urbye, Klaus; Beckmann, Franz; Schmauch, Hugo; and Flasche, Karl H., to Carl Still, Firma. Apparatus for producing blast furnace coal. 4,158,550, Cl. 44-13.000.

Wehde, Heinz, to Teldix GmbH. Yarn quality monitoring apparatus. 4,158,284, Cl. 57-265.000.

Wehner, Hermann W.: *See—*
Wirth, Hermann O.; and Wehner, Hermann W., 4,158,669, Cl. 260-429.700.

Weihe, Clyde R., Jr. Sailing simulator. 4,158,263, Cl. 35-11.00A.

Weinhold, Kerry L.: *See—*
Gard, George E.; Manning, Elvin K.; Rueggeberg, Werner; and Weinhold, Kerry L., 4,158,778, Cl. 250-461.00R.

Welsch, Wolfgang: *See—*
Mueller, Werner; Rotter, Christoph; and Welsch, Wolfgang, 4,158,485, Cl. 350-343.000.

Wenczl, Stephen: *See—*
Brescia, Anthony J.; Fecca, Edward G.; Wenczl, Stephen; and Schriever, Theodore W., 4,158,336, Cl. 108-111.000.

Werner, Peter: *See—*
Kosak, Wolfgang; Werner, Peter; Gerber, Hans; and Hidveghy, Ivan, 4,158,796, Cl. 318-245.000.

West, G. Allan: *See—*
Arends, Albert W.; Pickard, George L.; West, G. Allan; and Russell, Edward J., 4,158,539, Cl. 425-451.400.

Western Company of North America, The: *See—*
Anderson, Robert W.; and Kannenberg, Bob G., 4,158,521, Cl. 405-264.000.

Westinghouse Electric Corp.: *See—*
Andrews, Harry N.; and Orr, Richard S., 4,158,599, Cl. 176-30.000.
Bratkowski, Walter V.; and Grunert, Kurt A., 4,158,827, Cl. 335-16.000.
Cooper, Frank W., Jr.; Silverblatt, Bernard L.; Knight, Charles B.; and Berringer, Robert T., 4,158,605, Cl. 176-61.000.
Elsner, Hans J.; Antol, Ronald F.; and Castner, Raymond P., 4,158,309, Cl. 73-641.000.
Gerkey, Kenneth S., 4,158,601, Cl. 176-30.000.
Godwin, Gurney L., 4,158,788, Cl. 310-198.000.
Jones, Andrew R., 4,158,637, Cl. 208-449.00R.
Krause, Robert F.; and Pavlik, Norman M., 4,158,581, Cl. 148-105.000.
Krause, Robert F., 4,158,582, Cl. 148-120.000.
Pavlik, Norman M.; and Sefko, John, 4,158,561, Cl. 75-0.5BA.
Reynolds, William T.; and Pavlik, Norman M., 4,158,580, Cl. 148-104.000.
Smith, Richard C., 4,158,769, Cl. 250-255.000.
Young, Robert R., 4,158,415, Cl. 414-2.000.

Westport International: *See—*
Hellman, Robert R.; and French, Douglas M., 4,158,812, Cl. 325-37.000.

Wheeler, Harman: *See—*
Morang, Frank L., 4,158,281, Cl. 57-23.000.

Whelan, James P., to Ad-Tec Products, Inc. Paint strainer. 4,158,631, Cl. 210-497.00R.

Whirlpool Corporation: *See—*
Frohbieter, Edwin H., 4,158,426, Cl. 222-1.000.

White, Ben E.: *See—*
Geyer, Charles J., Jr.; and White, Ben E., 4,158,698, Cl. 422-189.000.

White, Dwain M., to General Electric Company. Heterocyclic-coupled polymers of polyphenylene oxides. 4,158,728, Cl. 528-213.000.

White, Malcolm, to White, Susan Beck. Roll bar safety frame for a tractor. 4,158,460, Cl. 280-756.000.

White, Susan Beck: *See*—
White, Malcolm, 4,158,460, Cl. 280-756.000.

Whitt, William D.: *See*—
Aldrich, Billy R.; and Whitt, William D., 4,158,742, Cl. 13-20.000.

Wickman Machine Tool Sales Limited: *See*—
Blockley, Alec G.; and McConnell, Edmund A., 4,158,319, Cl. 82-3.000.

Wideman, Ewell F. Gravity operated flag indicator device for mailboxes. 4,158,430, Cl. 232-35.000.

Wieczorek, Alfons: *See*—
Biolik, Felicjan; Gurgul, Franciszek; Odrobina, Stanislaw; Morys, Zygmunt; Wieczorek, Alfons; Wydmanski, Zenon; and Gawlowski, Piotr, 4,158,743, Cl. 13-25.000.

Wiedmann, Siegfried: *See*—
Berger, Horst H.; and Wiedmann, Siegfried, 4,158,783, Cl. 307-213.000.

Wielebski, Wayne H.; and Radtke, Joseph D., to Allen-Bradley Company. Solid state timer for sealed contact relay. 4,158,836, Cl. 340-309.100.

Wiermanski, Jerome J.: *See*—
Keller, Jack L.; and Wiermanski, Jerome J., 4,158,587, Cl. 156-216.000.

Wiland, Lawrence; Humphrey, Robert; and Consiglio, Peter, to Wiland, Lawrence; and Humphrey, Robert. Detachable fastener for a dental cap and prosthodontic method utilizing the same. 4,158,256, Cl. 32-12.000.

Wilhelm, Raymond L., to Talley Industries of Arizona, Inc. Air cushion restraint inflator assembly. 4,158,696, Cl. 422-166.000.

Willay, Gerard; and Wittmann, Andre. Apparatus for the automatic preparation and molding of samples for X-ray analysis. 4,158,536, Cl. 425-169.000.

Williams, Glenn D.: *See*—
Mattioli, Terrence W.; and Williams, Glenn D., 4,158,562, Cl. 75-41.000.

Williams, John G.; and Williams, Vera. Nutrient dispersal device. 4,158,269, Cl. 47-48.500.

Williams, Vera: *See*—
Williams, John G.; and Williams, Vera, 4,158,269, Cl. 47-48.500.

Williamson, William R. N.: *See*—
Ross, William J.; Verge, John P.; and Williamson, William R. N., 4,158,659, Cl. 260-307.00G.

Willsmer, Trevor R.: *See*—
Ford, Geoffrey E.; Pantelides, Antis; and Willsmer, Trevor R., 4,158,624, Cl. 209-523.000.

Wilson, Ray. Crane device. 4,158,414, Cl. 212-14.000.

Winch, Allen R., to Cotton, Incorporated. Impregnator/rinser. 4,158,297, Cl. 68-22.00R.

Wine, Charles M., to RCA Corporation. System for reducing the number of binary signals representing channel numbers. 4,158,815, Cl. 325-455.000.

Wine, Charles M., to RCA Corporation. Memory type tuning system with provisions for skipping nonpreferred tuning positions. 4,158,816, Cl. 325-464.000.

Wininger, David V. Self-powered tracking solar collector. 4,158,356, Cl. 126-271.000.

Wirfelt, Sven A. O., to Sandvik Aktiebolag. Methods and apparatus for detachably fastening a tool shaft to a tool holder. 4,158,522, Cl. 408-1.0BD.

Wirth, Hermann O.; and Wehner, Hermann W., to Ciba-Geigy Corporation. Organo-tin compounds. 4,158,669, Cl. 260-429.700.

Witten, John E.; Wood, Loren E.; and Short, Edward H., III, to Black, Sivalls & Bryson, Inc. Safety pressure relief apparatus. 4,158,422, Cl. 220-89.00A.

Wittenstein, Horst, to Carl Dan. Peddinghaus KG. Plural work-piece positioning apparatus. 4,158,761, Cl. 219-69.00R.

Witters, Hugo F. J.: *See*—
Wouters, Joannes C. A. M.; and Witters, Hugo F. J., 4,158,824, Cl. 333-213.000.

Wittmann, Andre: *See*—
Willay, Gerard; and Wittmann, Andre, 4,158,536, Cl. 425-169.000.

Wolfson, Gerald: *See*—
Pruznick, Michael D.; Keller, Bruce W.; Phelps, James R.; Wolfson, Gerald; and Heard, James L., 4,158,838, Cl. 340-750.000.

Wood, Eric. Power generation systems in buoyant structures. 4,158,780, Cl. 290-42.000.

Wood, Harvey L. Concealable antenna mount for CB antennas. 4,158,844, Cl. 343-715.000.

Wood, Loren E.: *See*—
Witten, John E.; Wood, Loren E.; and Short, Edward H., III, 4,158,422, Cl. 220-89.00A.

Worthington, Ralph E.: *See*—
Thompson, William H.; Worthington, Ralph E.; and Somers, Thomas N., 4,158,558, Cl. 71-34.000.

Wouters, Joannes C. A. M.; and Witters, Hugo F. J., to International Standard Electric Corporation. Multi-node immittance network. 4,158,824, Cl. 333-213.000.

Wright, Melvin A. Washbasin liner method and article. 4,158,585, Cl. 156-94.000.

Wuchner, Erwin; Heitmeyer, Ulrich; and Kostelezky, Walter, to Daimler-Benz Aktiengesellschaft. Method and apparatus for the control of the safety distance of a vehicle relative to preceding vehicles. 4,158,841, Cl. 343-7.0VM.

Wuerzer, Bruno: *See*—
Stubenrauch, Gerd; Hamprecht, Gerhard; Wuerzer, Bruno; and Retzlaff, Guenter, 4,158,559, Cl. 71-91.000.

Wunsch, Wolfgang: *See*—
Ehedy, Gustav; Kemter, Heinz; Ponitz, Wilfried; Ehrlich, Engelbert; Politze, Walter; Scholtis, Walter; and Wunsch, Wolfgang, 4,158,292, Cl. 66-190.000.

Wydmanski, Zenon: *See*—
Biolik, Felicjan; Gurgul, Franciszek; Odrobina, Stanislaw; Morys, Zygmunt; Wieczorek, Alfons; Wydmanski, Zenon; and Gawlowski, Piotr, 4,158,743, Cl. 13-25.000.

Wynne, Francis E.: *See*—
Lese, Henri K.; and Wynne, Francis E., 4,158,740, Cl. 562-549.000.

Wysocki, Lawrence, to Champion International Corporation. Tear out opening device. 4,158,412, Cl. 206-612.000.

Xerox Corporation: *See*—
Gray, Gerald A., Jr.; and Steiner, Edward L., 4,158,886, Cl. 364-518.000.

Yajima, Seishi; Hayashi, Josaburo; Omori, Mamoru; Kayano, Hideo; and Hamano, Masaaki, to Research Institute For Iron, Steel and Other Metals of the Tohoku University, The. Method for producing heat-resistant composite materials reinforced with continuous silicon carbide fibers. 4,158,687, Cl. 264-60.000.

Yamada, Kenji: *See*—
Nakajima, Fumio; Machida, Takayasu; and Yamada, Kenji, 4,158,287, Cl. 58-23.0BA.

Yamashita, Katsuji; Umetsu, Hiroshi; Heguri, Kazuyoshi; and Yoshida, Kasumi, to Hitachi, Ltd. Automatic chemical analyzing method and apparatus. 4,158,545, Cl. 23-230.00R.

Yamashita, Sinobu; and Takahashi, Kotei, to Nissan Motor Company, Limited. Electric switch apparatus for an automatic clutch in an automotive power train using a manual power transmission system. 4,158,404, Cl. 192-3.580.

Yamazaki, Masami: *See*—
Ando, Masahisa; Kato, Keigo; Yamazaki, Masami; and Kuroiwa, Yosio, 4,158,351, Cl. 123-119.00A.

Yane, Frank J. Device for heating liquid in a container. 4,158,764, Cl. 219-523.000.

Yarwood, John C.; Yun, Ik Y.; and Tyler, Derek E., to Olin Corporation. Electromagnetic casting method and apparatus. 4,158,379, Cl. 164-49.000.

Yasuda, Takeru: *See*—
Iwata, Minoru; Yasuda, Takeru; and Hagiwara, Shyoichi, 4,158,289, Cl. 60-276.000.

Yasuhara, Takeshi; Tamai, Mitsuru; Yuhara, Tadanori; and Asano, Isamu, to Fuji Electric Co., Ltd. Pressure sensing device. 4,158,311, Cl. 73-718.000.

Yeagle, Richard J., to General Filters, Inc. Water distributor trough primarily for a warm air furnace mounted humidifier. 4,158,679, Cl. 261-106.000.

Yearout, James D. Nitrogen-methane separation process and system. 4,158,556, Cl. 62-28.000.

Yonezaki, Jimpachi; Takahashi, Yoshihiro; Shimada, Toshihiko; and Okuyama, Katsuo, to Fujitsu Limited. Mounting apparatus for communication exchange equipment. 4,158,754, Cl. 179-98.000.

Yoo, Jin S.: *See*—
Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., 4,158,548, Cl. 44-1.00R.

Yoshida, Kasumi: *See*—
Yamashita, Katsuji; Umetsu, Hiroshi; Heguri, Kazuyoshi; and Yoshida, Kasumi, 4,158,545, Cl. 23-230.00R.

Yoshida, Tomiharu: *See*—
Akimoto, Seiichi; Watanabe, Mitsuhiro; Yoshida, Tomiharu; Sugaya, Zunichi; Saito, Takashi; and Ishii, Yoshimi, 4,158,600, Cl. 176-30.000.

Young, Patricia A.: *See*—
Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, 4,158,663, Cl. 260-345.200.

Young, Robert R., to Westinghouse Electric Corp. Remote access manipulator. 4,158,415, Cl. 414-2.000.

Ysbrand, Floyd R.; and Crafts, Robert L., to Telex Computer Products, Inc. Reflecting means for visual inspection of magnetic tape head. 4,158,870, Cl. 360-128.000.

Yuhara, Tadanori: *See*—
Yasuhara, Takeshi; Tamai, Mitsuru; Yuhara, Tadanori; and Asano, Isamu, 4,158,311, Cl. 73-718.000.

Yun, Ik Y.: *See*—
Yarwood, John C.; Yun, Ik Y.; and Tyler, Derek E., 4,158,379, Cl. 164-49.000.

Zabotin, Alexandr A.: *See*—
Onikov, Eduard A.; Galperin, Alexandr L.; Zabotin, Alexandr A.; Loschilin, Evgeny D.; and Kolobanov, Nikolai I., 4,158,373, Cl. 139-436.000.

Zahner, Hans: *See*—
Dahn, Ursula; Hagenmaier, Hanspaul; Hohne, Helmut; Konig, Wilfried; Scheinpflug, Hans; and Zahner, Hans, 4,158,608, Cl. 195-80.00R.

Zahorsky, James T., to International Business Machines Corporation. Information display apparatus. 4,158,837, Cl. 340-804.000.

Zenith Radio Corporation: *See*—
Citta, Richard W., 4,158,882, Cl. 363-127.000.

Zeta Research, Inc.: *See*—
Gordon, James F., 4,158,846, Cl. 346-136.000.

Zucker, Ethel, administratrix: *See*—
Guenther, Robert P.; and Zucker, Melvin S., deceased, 4,158,825, Cl. 333-257.000.

Zucker, Melvin S., deceased: *See*—
Guenther, Robert P.; and Zucker, Melvin S., deceased, 4,158,825, Cl. 333-257.000.

Zumsteg, D. Bruce: *See*—
Bundy, Richard P.; Zumsteg, D. Bruce; and Rheinfrank, Lamson, Jr., 4,158,554, Cl. 55-379.000.

Zutaut, Chesley L.: *See*—
Brower, Loyd R., Jr.; Madsen, Leonard P.; and Zutaut, Chesley L., 4,158,619, Cl. 204-181.00R.

Zweifel, Hans: *See*—
Baumann, Niklaus; Zweifel, Hans; Baumann, Marcus; and Waterhouse, John S., 4,158,730, Cl. 528-273.000.
Baumann, Niklaus; Zweifel, Hans; Baumann, Marcus; and Waterhouse, John S., 4,158,731, Cl. 528-322.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF JUNE, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bass, Larry F., to Rockwell International Corporation. Data communications network remote test and control system. Re. 30,037, Cl. 340-146.10E.

Caudill, Freddie R.: *See*—
DeRegnaucourt, Robert A.; Hall, John C.; and Caudill, Freddie R., Re. 30,036, Cl. 301-13.0SM.

Csathy, Denis G.; Hung, Wendell L. Y.; and Heath, Jon M., to Deltak Corporation. Vertical firetube waste heat boiler. Re. 30,033, Cl. 122-7.00R.

Dayton Walther Corporation: *See*—
DeRegnaucourt, Robert A.; Hall, John C.; and Caudill, Freddie R., Re. 30,036, Cl. 301-13.0SM.

Deltak Corporation: *See*—
Csathy, Denis G.; Hung, Wendell L. Y.; and Heath, Jon M., Re. 30,033, Cl. 122-7.00R.

DeRegnaucourt, Robert A.; Hall, John C.; and Caudill, Freddie R., to Dayton Walther Corporation. Vehicle wheels, spacers and dual rims. Re. 30,036, Cl. 301-13.0SM.

Hall, John C.: *See*—
DeRegnaucourt, Robert A.; Hall, John C.; and Caudill, Freddie R., Re. 30,036, Cl. 301-13.0SM.

Heath, Jon M.: *See*—
Csathy, Denis G.; Hung, Wendell L. Y.; and Heath, Jon M., Re. 30,033, Cl. 122-7.00R.

Hung, Wendell L. Y.: *See*—
Csathy, Denis G.; Hung, Wendell L. Y.; and Heath, Jon M., Re. 30,033, Cl. 122-7.00R.

Marlo S.p.A.: *See*—
Serratto, Angelo, Re. 30,034, Cl. 165-123.000.

Miller, Eldon S. Articulated link conveyor. Re. 30,035, Cl. 198-850.000.

Rockwell International Corporation: *See*—
Bass, Larry F., Re. 30,037, Cl. 340-146.10E.

Serratto, Angelo, to Marlo S.p.A. Local conditioning induction-type apparatus employing primary inlet air as a power means for controlling temperature. Re. 30,034, Cl. 165-123.000.

LIST OF DESIGN PATENTEES

Ahlenfeld, Carl B.; and Macey, James D. Lacrosse stick head. 252,167, 6-19-79, Cl. D21-210.000.

American Tourister, Inc.: *See*—
Koffler, Sol, 252,175, Cl. D3-71.000.

Bardeau, William M. Tiltable frying pan structure and support therefor. 252,152, 6-19-79, Cl. D15-104.000.

Barry, Bernard R. Bird feeder. 252,162, 6-19-79, Cl. D30-14.000.

Bell, George R.: *See*—
Oakley, Ervin C.; Bell, George R.; and Poole, William E., 252,125, Cl. D6-167.000.

Bernardo, Leo. Shutter. 252,159, 6-19-79, Cl. D25-47.000.

Bio-Temp Products, Inc.: *See*—
Khemka, Kailash C., 252,136, Cl. D10-57.000.

Blake, Joseph W., III: *See*—
Einhorn, Ruediger; Chasen, Lee R.; and Blake, Joseph W., III, 252,131, Cl. D8-51.000.

Boot, Robin P., to Dobson Park Industrial Products Ltd. Typewriter. 252,153, 6-19-79, Cl. D18-1.000.

Boot, Robin P., to Dobson Park Industrial Products Ltd. Typewriter. 252,154, 6-19-79, Cl. D18-1.000.

Boot, Robin P., to Dobson Park Industrial Products Ltd. Typewriter. 252,171, 6-19-79, Cl. D18-1.000.

BPA Byggproduktion AB: *See*—
Gavel, Margareta; and Gavel, Peter, 252,129, Cl. D6-191.000.

Brownlie, Alan W.: *See*—
Nitsch, Edward J.; Brownlie, Alan W.; and Jones, Kent S., 252,147, Cl. D13-37.000.

Carmean, Vernon M. Movable tray for pick-up trucks. 252,144, 6-19-79, Cl. D12-157.000.

Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Tote box for fruit or the like. 252,172, 6-19-79, Cl. D3-67.000.

Chasen, Lee R.: *See*—
Einhorn, Ruediger; Chasen, Lee R.; and Blake, Joseph W., III, 252,131, Cl. D8-51.000.

Child Guidance Playthings, Inc.: *See*—
Satten, Michael I., 252,168, Cl. D21-64.000.

Chojna, Harry. Vehicle speedometer metric conversion label. 252,139, 6-19-79, Cl. D10-103.000.

Coats & Clark, Inc.: *See*—
Einhorn, Ruediger; Chasen, Lee R.; and Blake, Joseph W., III, 252,131, Cl. D8-51.000.

Concept, Inc.: *See*—
Simmons, Raymond W., 252,170, Cl. D48-24.00A.

Cook, William J., to General Electric Company. Electric clock or similar article. 252,134, 6-19-79, Cl. D10-21.000.

Creative Playgrounds Corporation: *See*—
Dieter, Berthold B.; and Gibson, Charles L., 252,166, Cl. D21-245.000.

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Rutherford, James E., to Plastech Research, Inc. Fire extinguisher wall mounted cabinet. 252,121, 6-19-79, Cl. D6-127.000.
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Salt, John B.; and Salt, David J. Doll. 252,164, 6-19-79, Cl. D21-166.000.
Satten, Michael I., to Child Guidance Playthings, Inc. Toy piano. 252,168, 6-19-79, Cl. D21-64.000.
Schramm, Buford J.; and Everts, Robert G. Internal combustion engine. 252,148, 6-19-79, Cl. D15-3.000.
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Simmons, Raymond W., to Concept, Inc. Pocket penlight. 252,170, 6-19-79, Cl. D48-24.00A.
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